

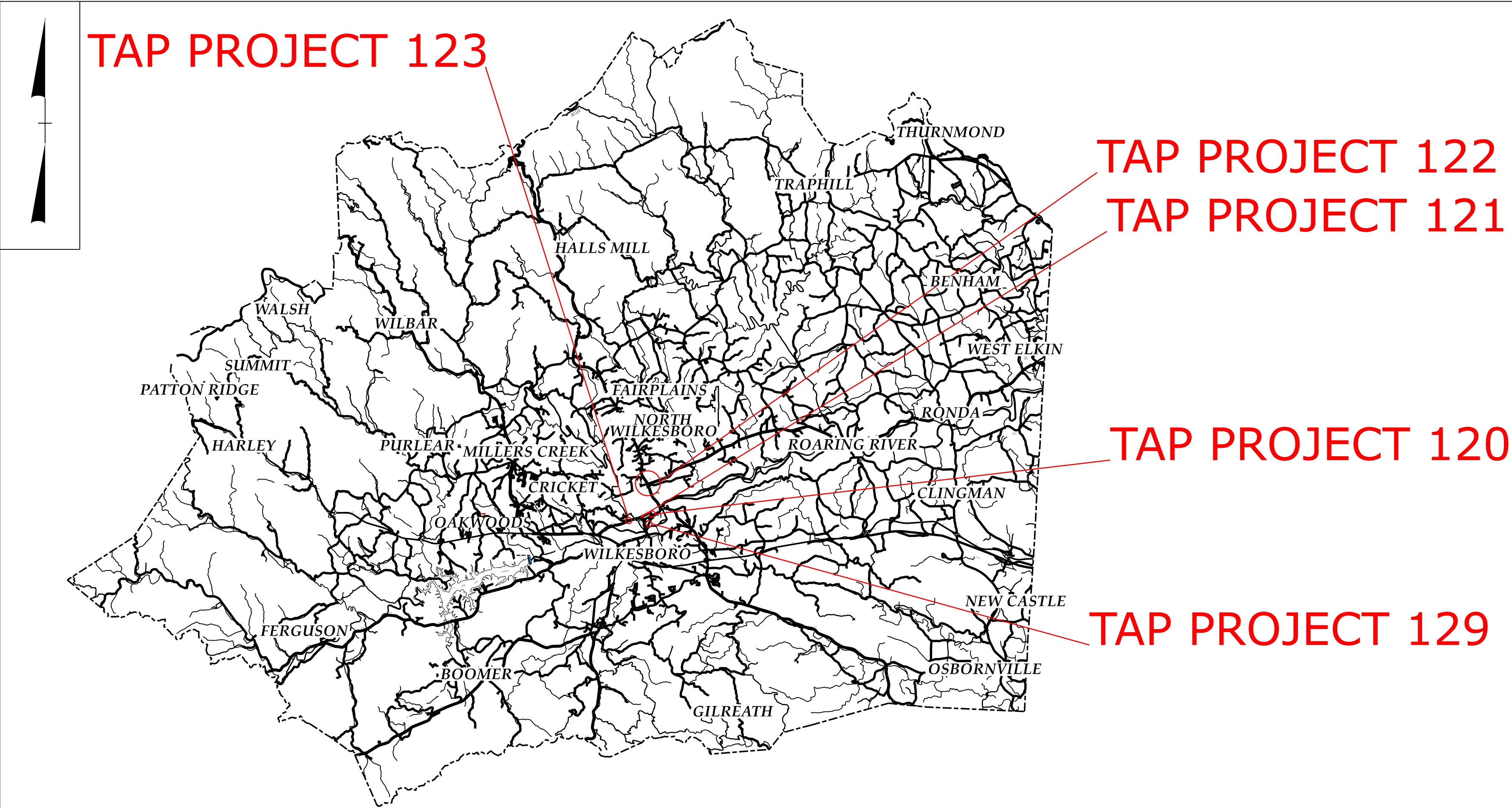
See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WILKES COUNTY

TYPE OF WORK: *INSTALLATION OF PEDESTRIAN SIGNALS AND
CONSTRUCTION OF CONCRETE CURB RAMPS*

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BN-0031KB	11	
STATE PROJ. NO.		F. A. PROJ. NO.	DESCRIPTION
52073.11.7		TAPE011	
52073.11.302		TA11302	

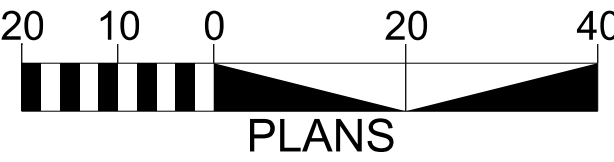


VICINITY MAP (NTS)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT: DK00500 PROJECT: BN-0031KB

GRAPHIC SCALES



PROJECT LENGTH

N/A

Prepared in the Office of:
KCI Associates of N.C., P.A.
4800 Falls of Neuse Road, Suite 200
Raleigh, NC 27609
Phone (919) 783-9214
NC Firm License No: C-0764

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:

JOSEPH L. LEWIS, PE
PROJECT ENGINEER

TYLER L. CAREY, PE
PROJECT DESIGN ENGINEER

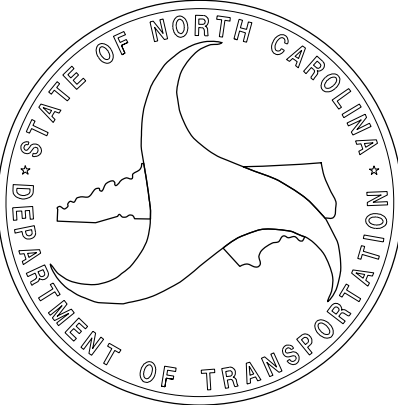
ALEXANDER W. REESE
NCDOT CONTACT

HYDRAULICS ENGINEER

Signed by: *Heath Young* 7/22/2026
ES20ABEBFF034F6
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

Signed by: *Tyler Carey* 7/22/2026
C201EE113800F46F
SIGNATURE: P.E.



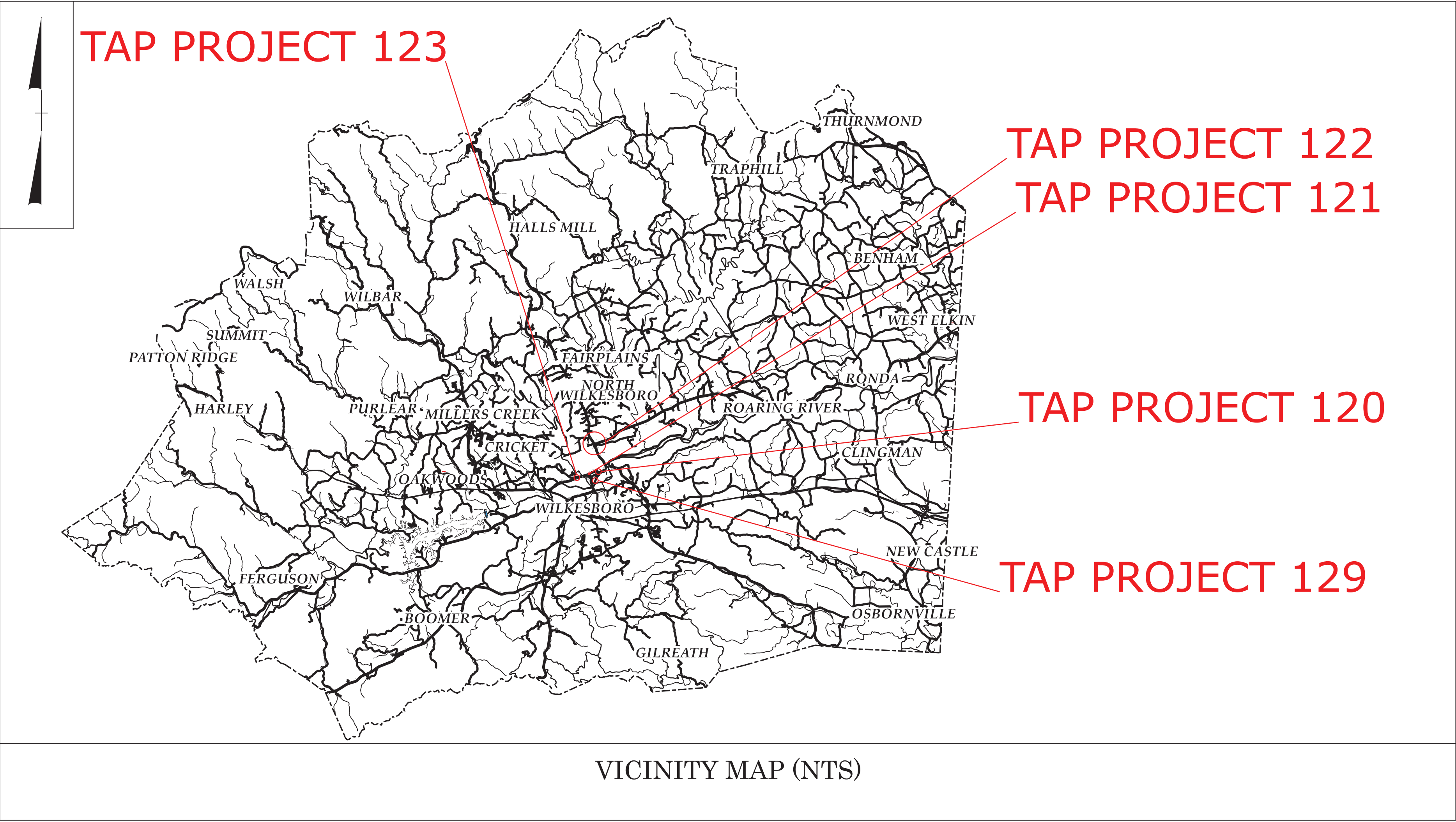
See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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TYPE OF WORK: *INSTALLATION OF PEDESTRIAN SIGNALS AND
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52073.11.302	TA11302		



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NC Firm License No: C-0764

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PROJECT ENGINEER

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PROJECT DESIGN ENGINEER

ALEXANDER W. REESE
NCDOT CONTACT

HYDRAULICS ENGINEER

7/22/2026

P.E.

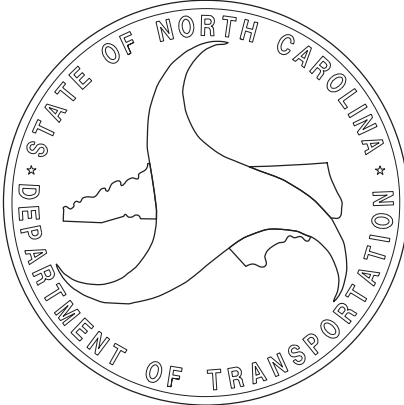
SIGNATURE:

ROADWAY DESIGN ENGINEER

7/22/2026

P.E.

SIGNATURE:



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEET, GENERAL NOTES, PAVEMENT MARKING LEGEND
1B	TAP 120 SITE MAP
1C	TAP 121 SITE MAP
1D	TAP 122 SITE MAP
1E	TAP 123 SITE MAP
1F	TAP 129 SITE MAP
2C-1 THRU 2C-4	CURB RAMP DETAILS
2C-5	SPECIAL DETAILS
4 THRU 6	TAP 120 SITE LAYOUT SHEET
7 THRU 10	TAP 121 SITE LAYOUT SHEET
11 THRU 14	TAP 122 SITE LAYOUT SHEET
15	TAP 123 SITE LAYOUT SHEET
16	TAP 129 SITE LAYOUT SHEET

GENERAL NOTES

- 1) REFER TO 2024 NCDOT STANDARD DRAWING NO. 848.06 AND/OR 2C SHEETS FOR CURB RAMP INSTALLATION.
- 2) REFER TO 2024 NCDOT STANDARD DRAWING NO. 1205.07 FOR CROSSWALK INSTALLATION.

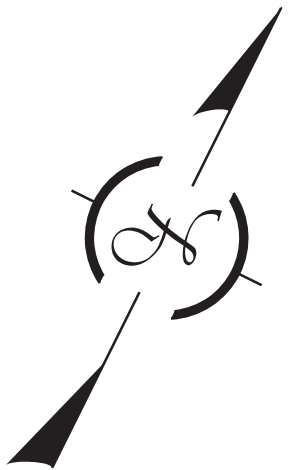
PAVEMENT MARKING LEGEND

SYMBOL	DESCRIPTION
T46	THERMOPLASTIC WHITE CROSSWALK LINE (8", 90 MILS)
T61	THERMOPLASTIC WHITE STOPBAR (24", 90 MILS)
T62	THERMOPLASTIC WHITE CROSSWALK LINE (24", 90 MILS)

TAP 120 SITE MAP

LOCATION: NORTH WILKESBORO, WILKES COUNTY

- SITE 1 (11-0903) – US 421 BUSINESS (MAIN STREET) AND 5TH STREET. (SEE SHEET 4)
- SITE 2 (11-0904) – US 421 BUSINESS (MAIN STREET) AND 6TH STREET. (SEE SHEET 5)
- SITE 3 (11-0914) – US 421 BUSINESS (D STREET) AND 6TH STREET. (SEE SHEET 6)



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18

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ENGINEER

7/22/2026

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Raleigh, NC 27609
Phone: (919) 783-6214
NC Firm License No. CA704

TAP 121 SITE MAP

LOCATION: NORTH WILKESBORO, WILKES COUNTY

- SITE 1 (11-0073) – US 421 BUSINESS (D STREET) AND NC 18-268 (CBD LOOP). (SEE SHEET 7)
- SITE 2 (11-0910) – US 421 BUSINESS (D STREET) AND 10TH STREET (SR 2367). (SEE SHEET 8)
- SITE 3 (11-0912) – US 421 BUSINESS (D STREET) AND 9TH STREET. (SEE SHEET 9)
- SITE 4 (11-0913) – US 421 BUSINESS (D STREET) AND 8TH STREET. (SEE SHEET 10)



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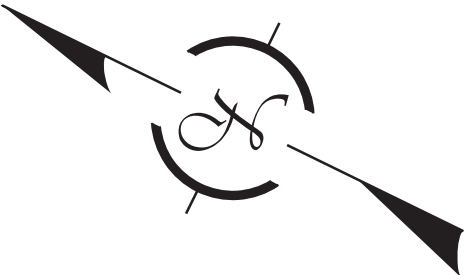
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4800 Falls of Peace Road, Suite 200
Raleigh, NC 27609
Phone (919) 783-6214
NC Firm License No. CA704

TAP 122 SITE MAP

LOCATION: NORTH WILKESBORO, WILKES COUNTY

- SITE 1 (11-0090) – NC 18 (SPARTA ROAD) AT PIZZA HUT /VILLAGE MARKET SHOPPING CENTER. (SEE SHEET 11)
- SITE 2 (11-1120) – NC 18 (SPARTA ROAD) AT SUNSET DRIVE (SR 1517) AND GRANDVIEW DRIVE. (SEE SHEET 12)
- SITE 3 (11-0941) – NC 18-268 /NC 18 (2ND STREET) AT NC 268 (ELKIN HIGHWAY). (SEE SHEET 13)
- SITE 4 (11-0942) – NC 18-268 (2ND STREET) AT BOSTON AVENUE AND M STREET. (SEE SHEET 14)



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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

PROFESSIONAL
SEAL
053669
ENGINEER
WILKES COUNTY

7/27/2026

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TAP 123 SITE MAP

LOCATION: NORTH WILKESBORO, WILKES COUNTY
SITE (11-0927) – US 421 BUSINESS (WEST D STREET) AND BOONE TRAIL (SR 1500). (SEE SHEET 15)



BN-0031KB

IE

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

7/22/2026

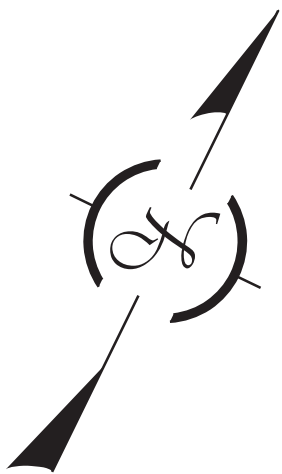
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NC Firm License No. CA0704

TAP 129 SITE MAP

LOCATION: NORTH WILKESBORO, WILKES COUNTY
SITE – WILKESBORO AVE (SR 2366) AND 9TH STREET. (SEE SHEET 16)



BN-0031KB

IF

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT

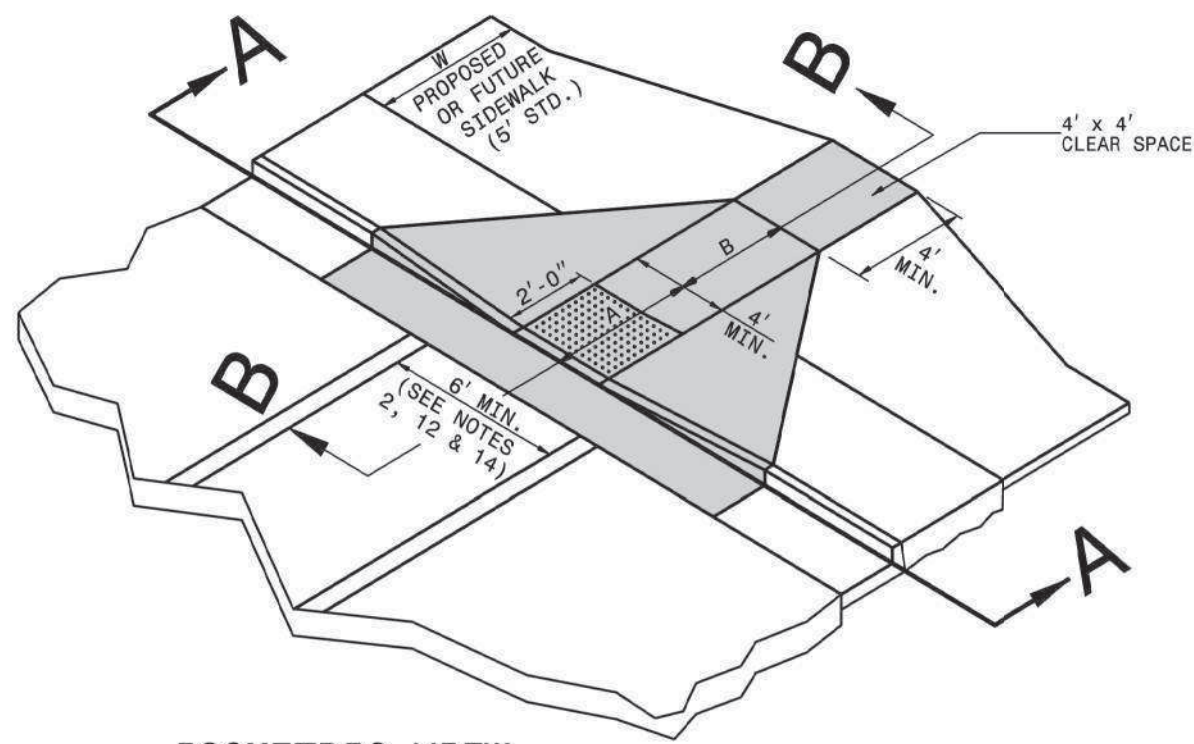
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ENGINEER

7/22/2026

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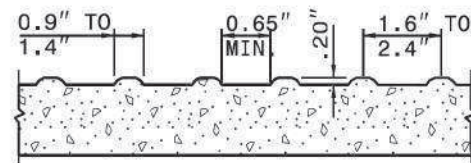
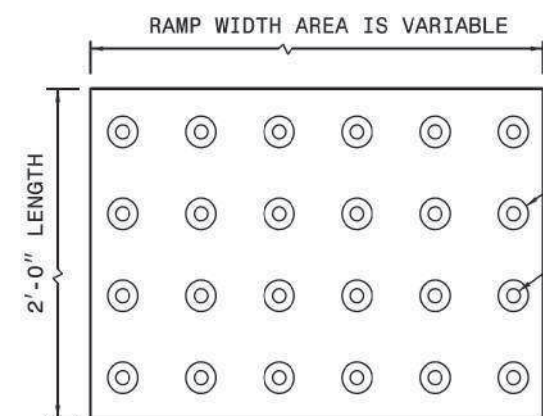
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Raleigh, NC 27609
Phone (919) 783-6214
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ISOMETRIC VIEW

PAY LIMITS FOR CURB RAMP

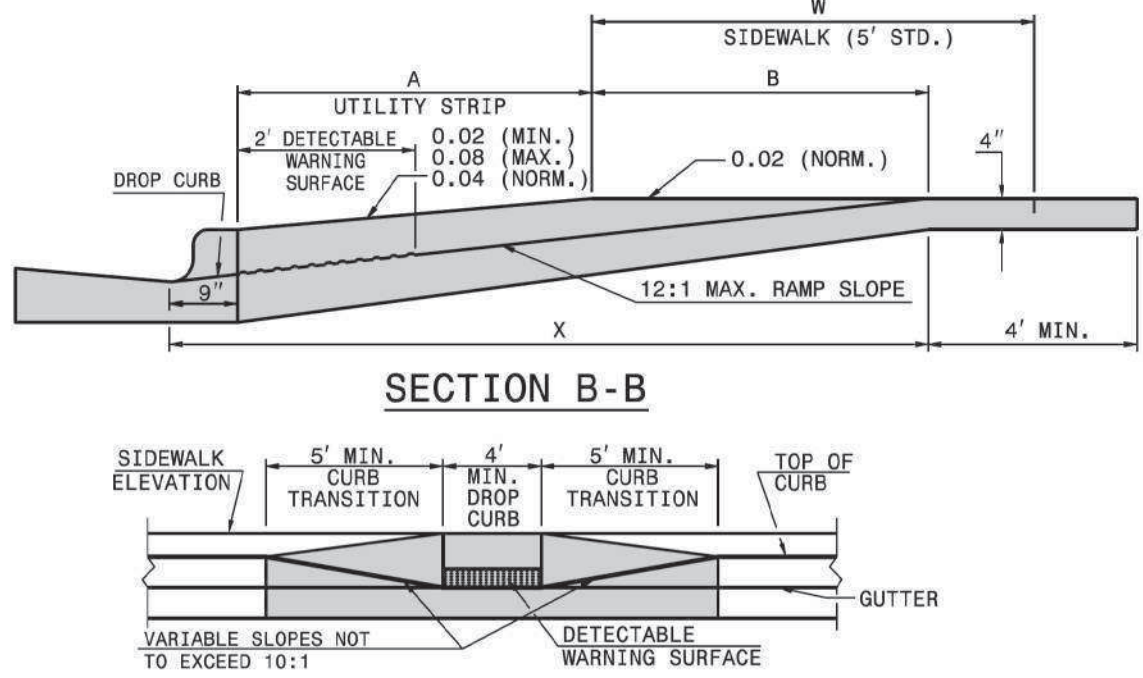
NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



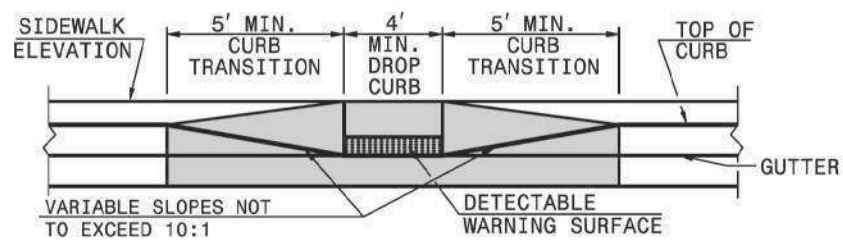
DETECTABLE WARNING SURFACE

W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0'
6'	0.0'	6.8'	6.8'	6.0'
7'	0.0'	7.8'	7.3'	6.5'
8'	0.0'	8.8'	7.3'	6.5'
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	3.5'	9.3'	8.4'	4.1'
5'	4.0'	9.8'	8.6'	3.8'
5'	4.5'	10.3'	8.7'	3.4'
5'	5.0'	10.8'	8.9'	3.1'

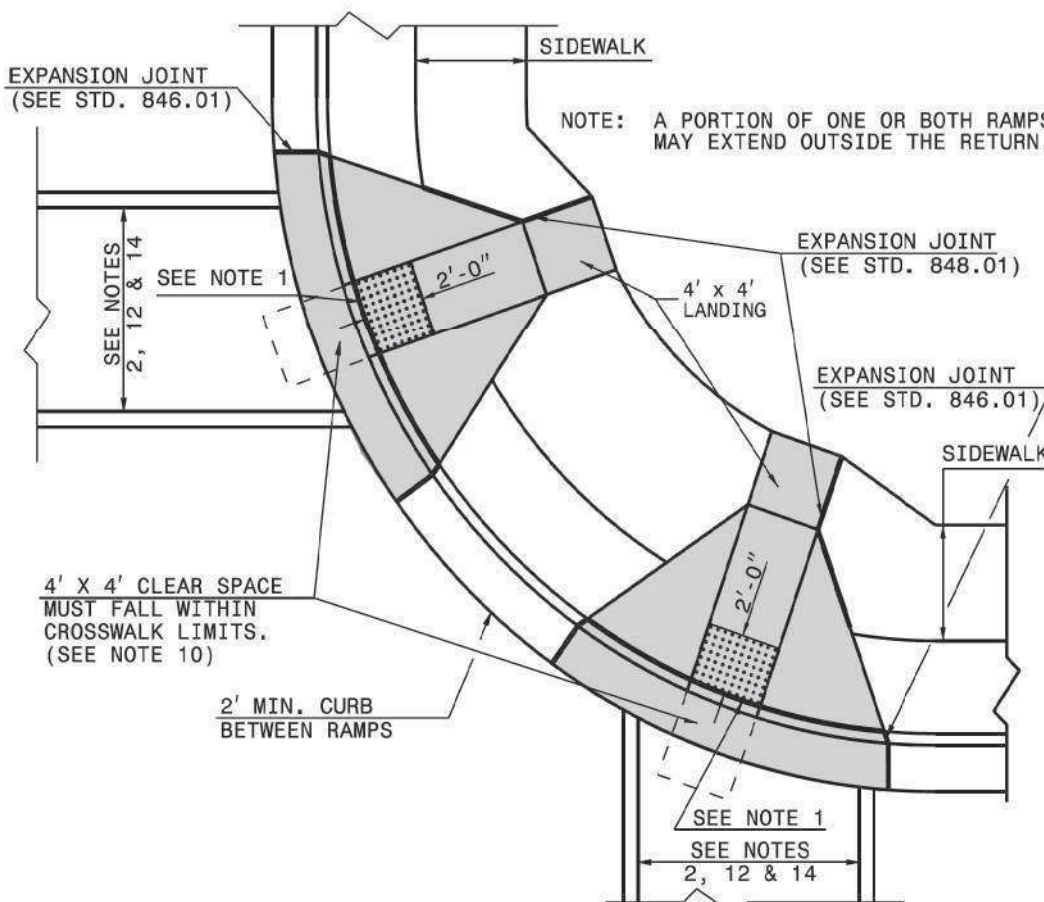
B = X - (A+9")
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



SECTION B-B



SECTION A-A



PLAN VIEW

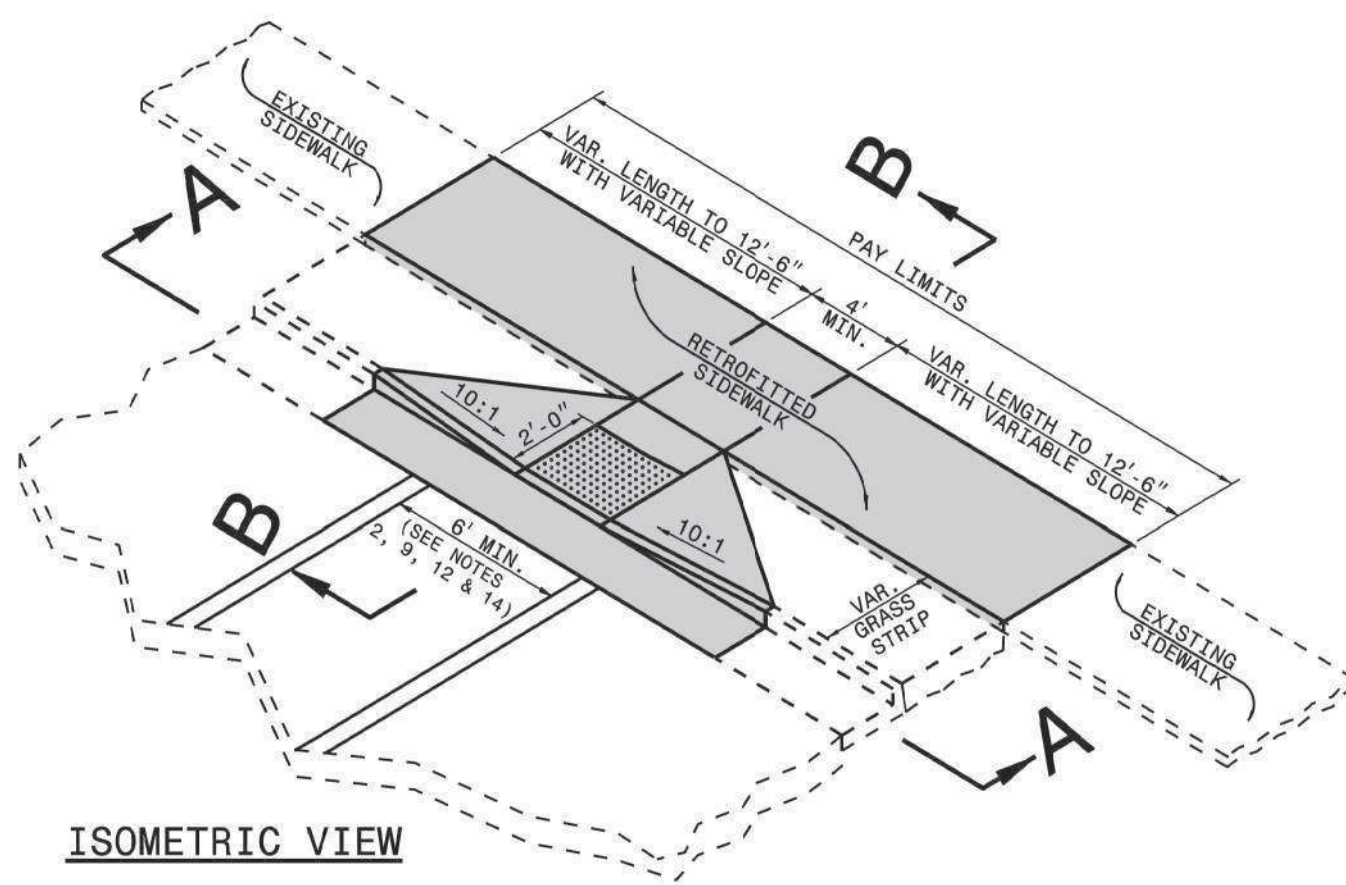
DUAL RAMPS
ANY RADII
(4' MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

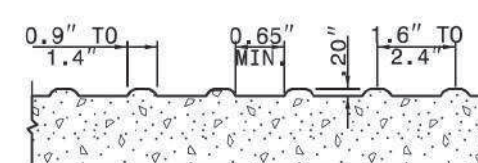
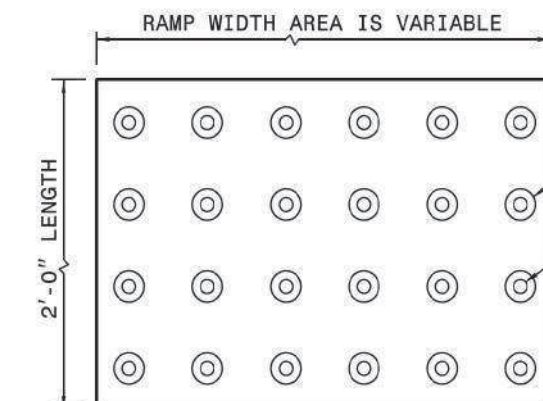
ROADWAY STANDARD DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 1 OF 13
848.06



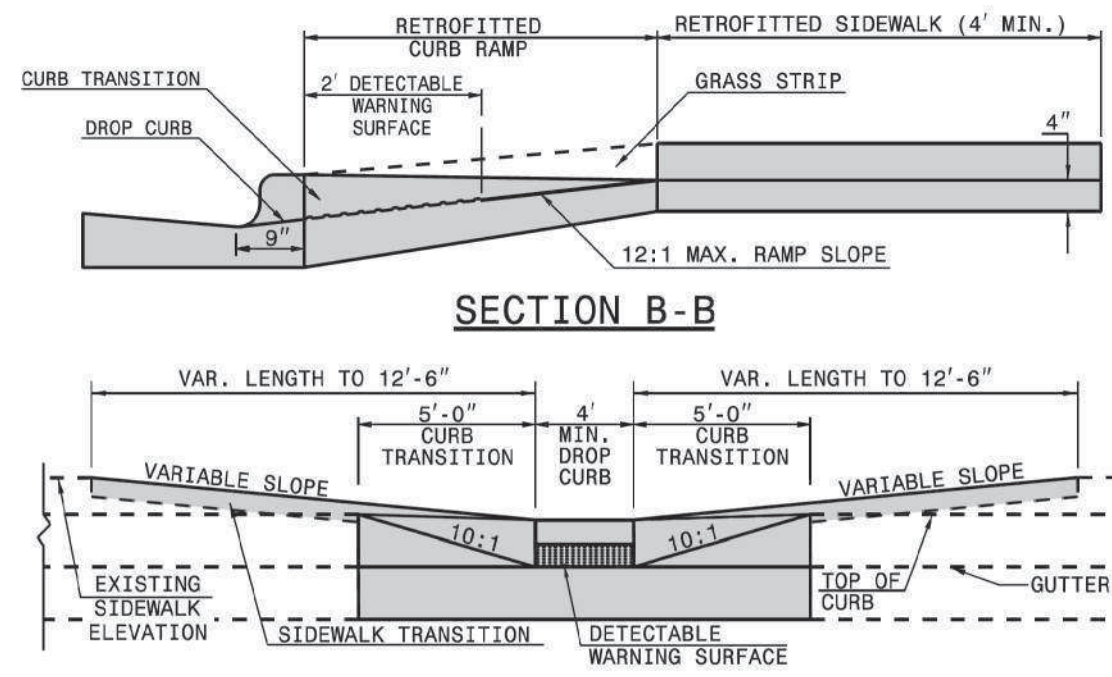
ISOMETRIC VIEW

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

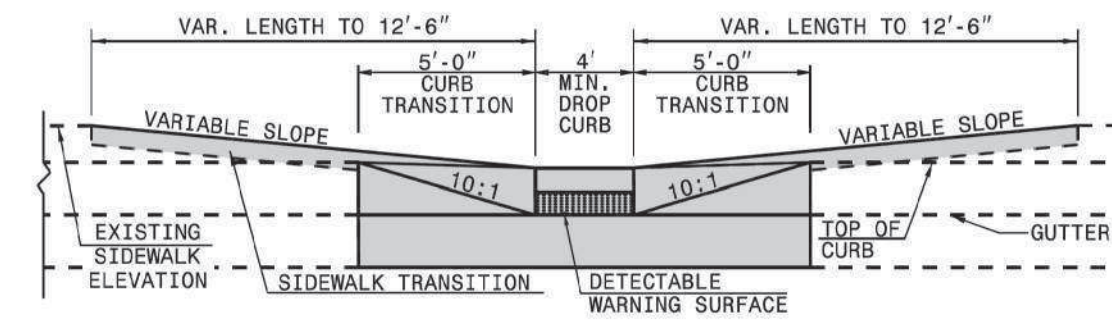


DETECTABLE WARNING SURFACE

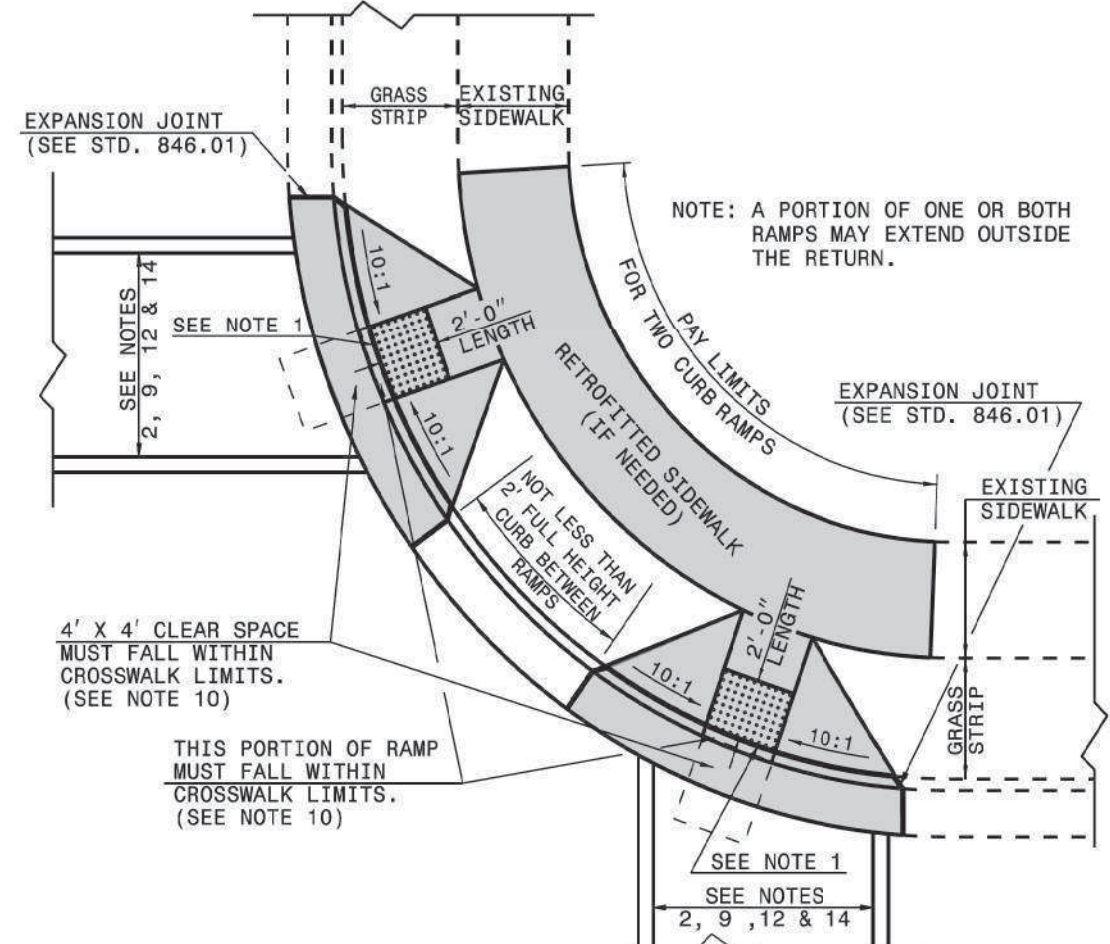
PAY LIMITS OF CURB RAMP



SECTION B-B



SECTION A-A



PLAN VIEW

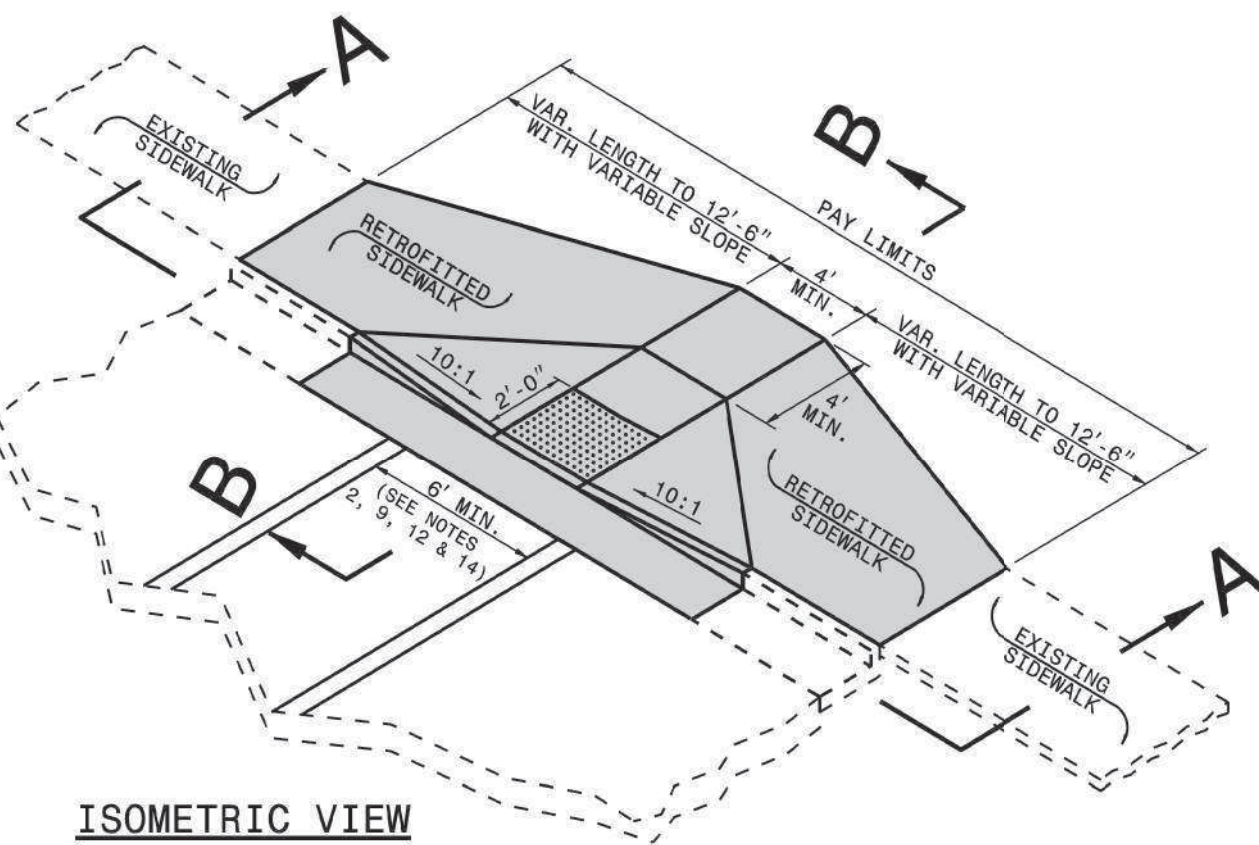
DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

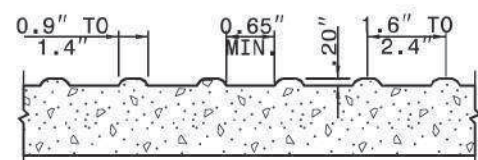
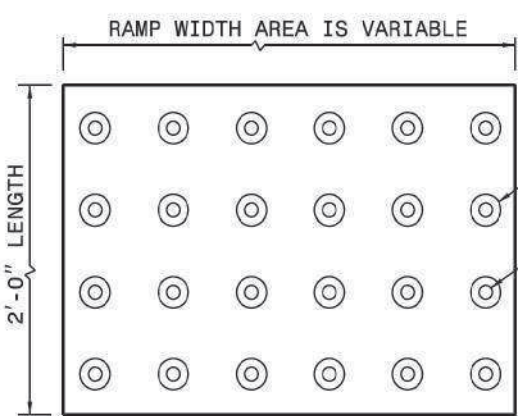
ROADWAY STANDARD DRAWING FOR
CURB RAMP
CURB RAMP AND EXISTING SIDEWALK WITH GRASS STRIP

SHEET 2 OF 13
848.06



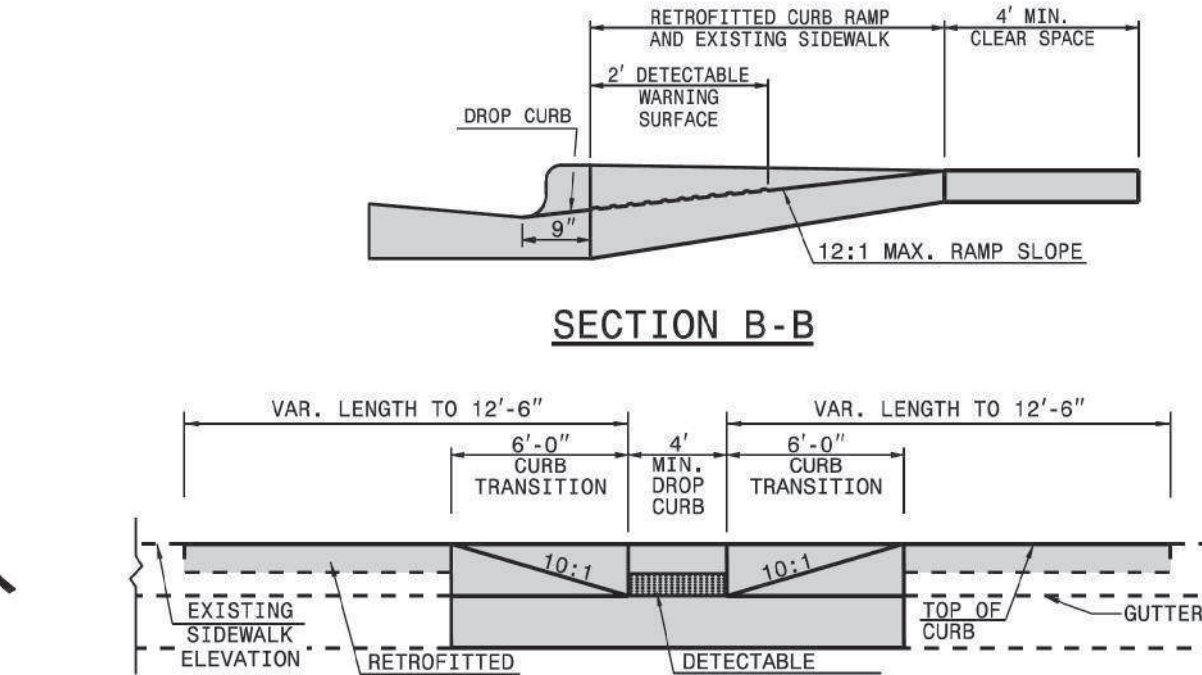
ISOMETRIC VIEW

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
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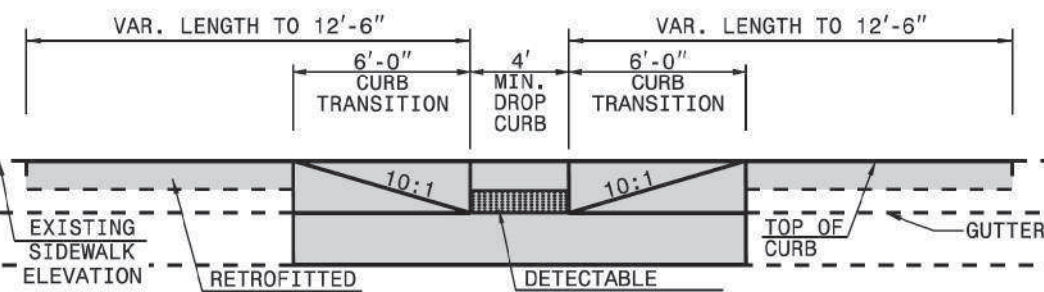


DETECTABLE WARNING SURFACE

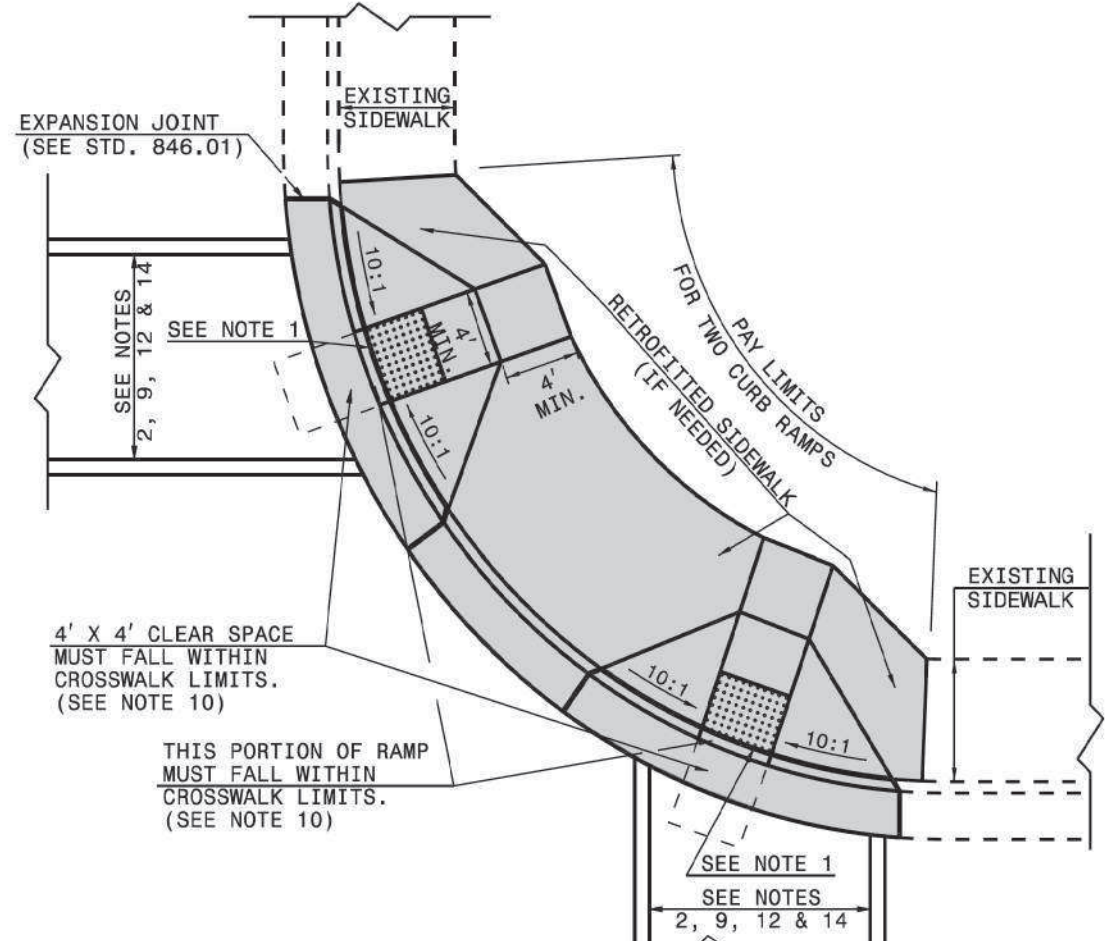
PAY LIMITS OF CURB RAMP



SECTION B-B



SECTION A-A



PLAN VIEW

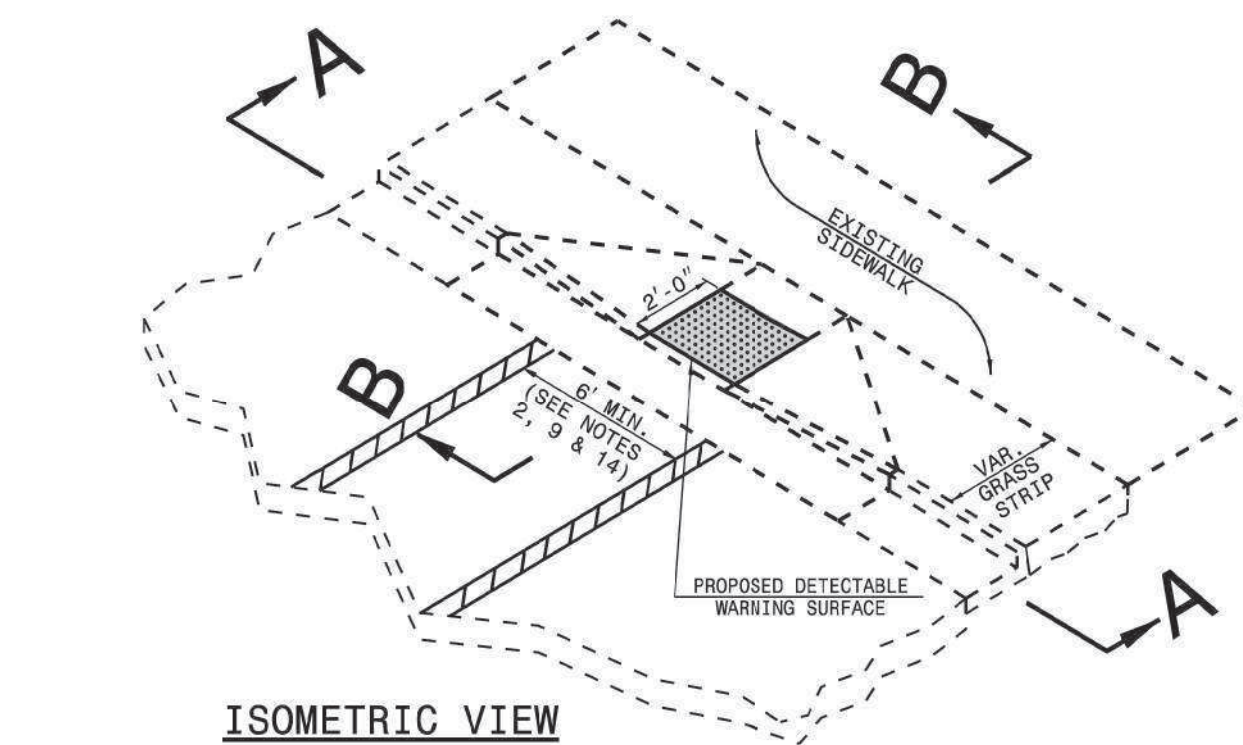
DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

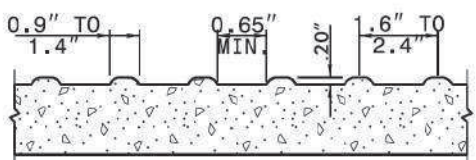
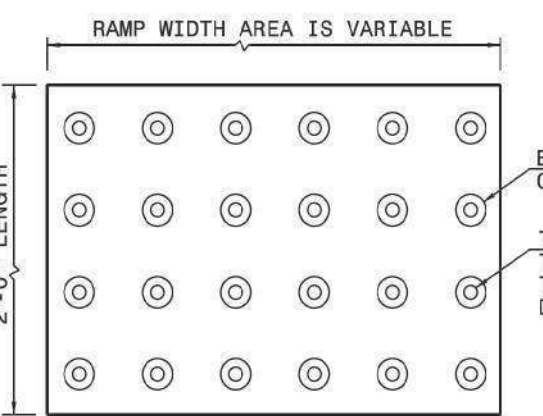
ROADWAY STANDARD DRAWING FOR
CURB RAMP
CURB RAMP AND EXISTING SIDEWALK ADJACENT TO CURB

SHEET 3 OF 13
848.06



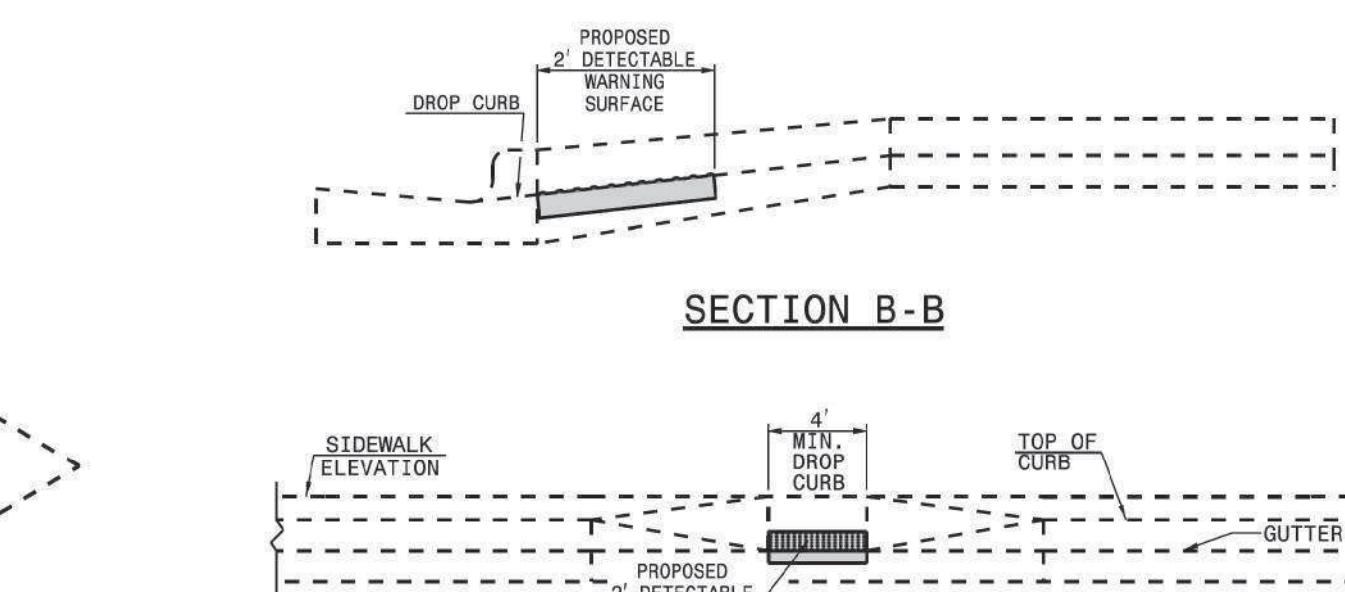
ISOMETRIC VIEW

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



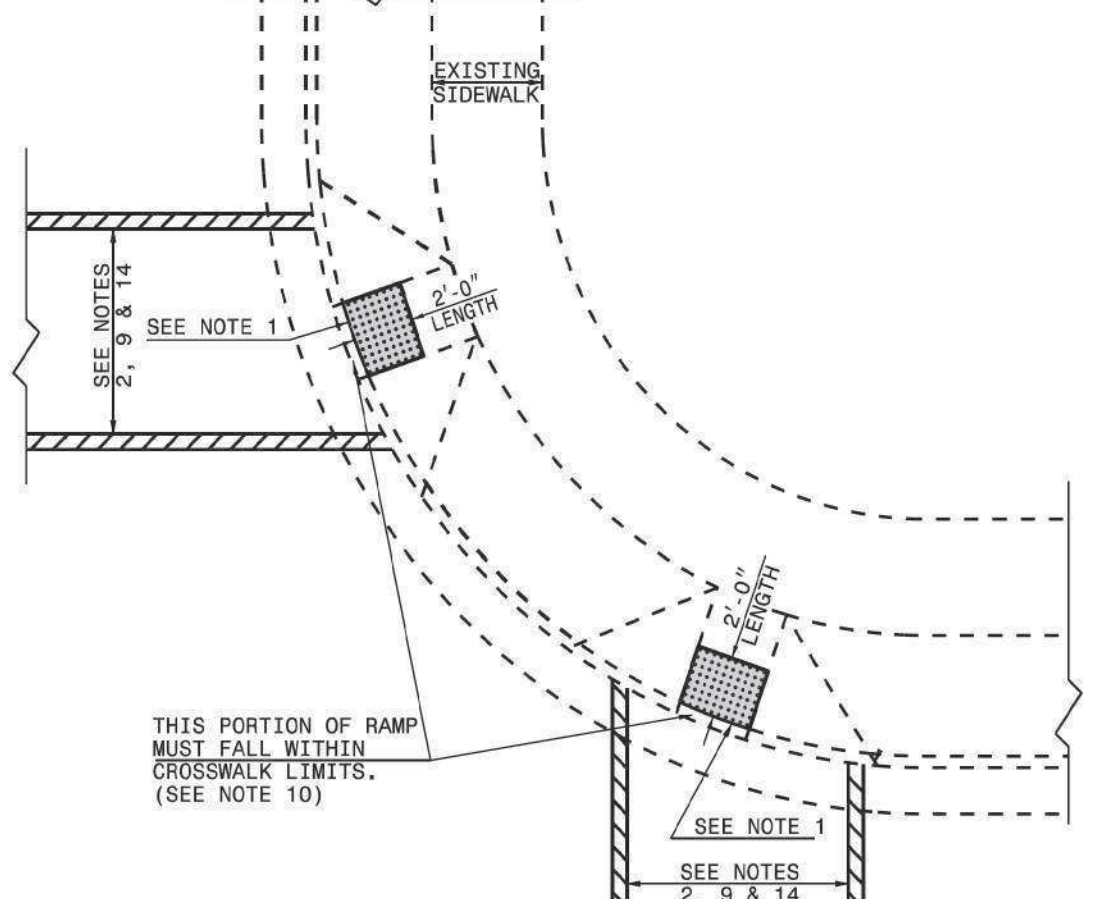
DETECTABLE WARNING SURFACE

PAY LIMITS OF RETROFIT CURB RAMP



SECTION B-B

SECTION A-A



PLAN VIEW

DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

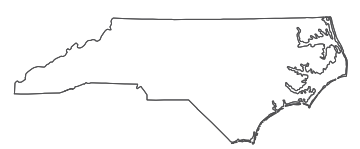
ROADWAY STANDARD DRAWING FOR
CURB RAMP
RETROFITTING DETECTABLE WARNING SURFACE ONTO EXISTING CURB RAMP

SHEET 4 OF 13
848.06

BN-0031KB

20-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

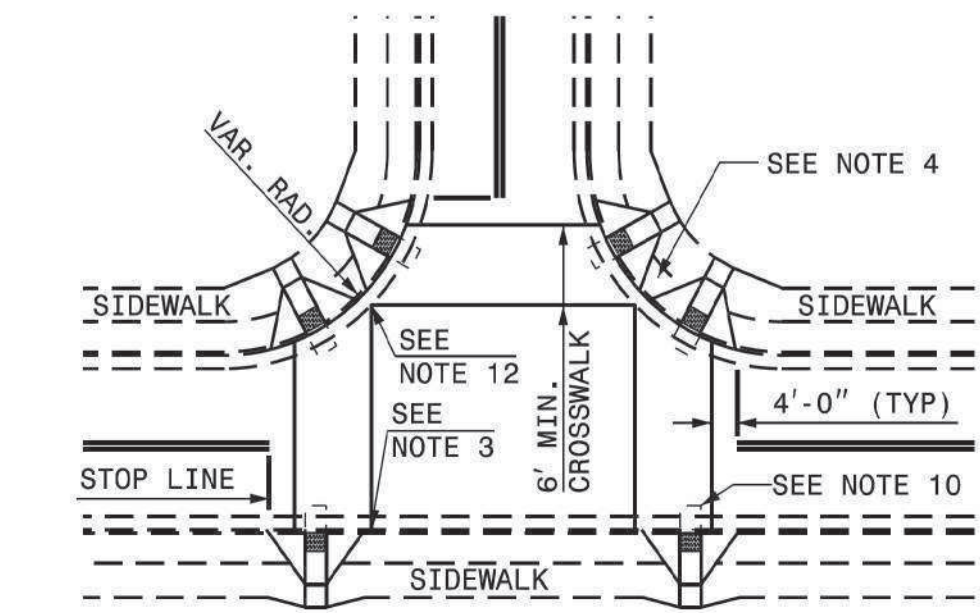


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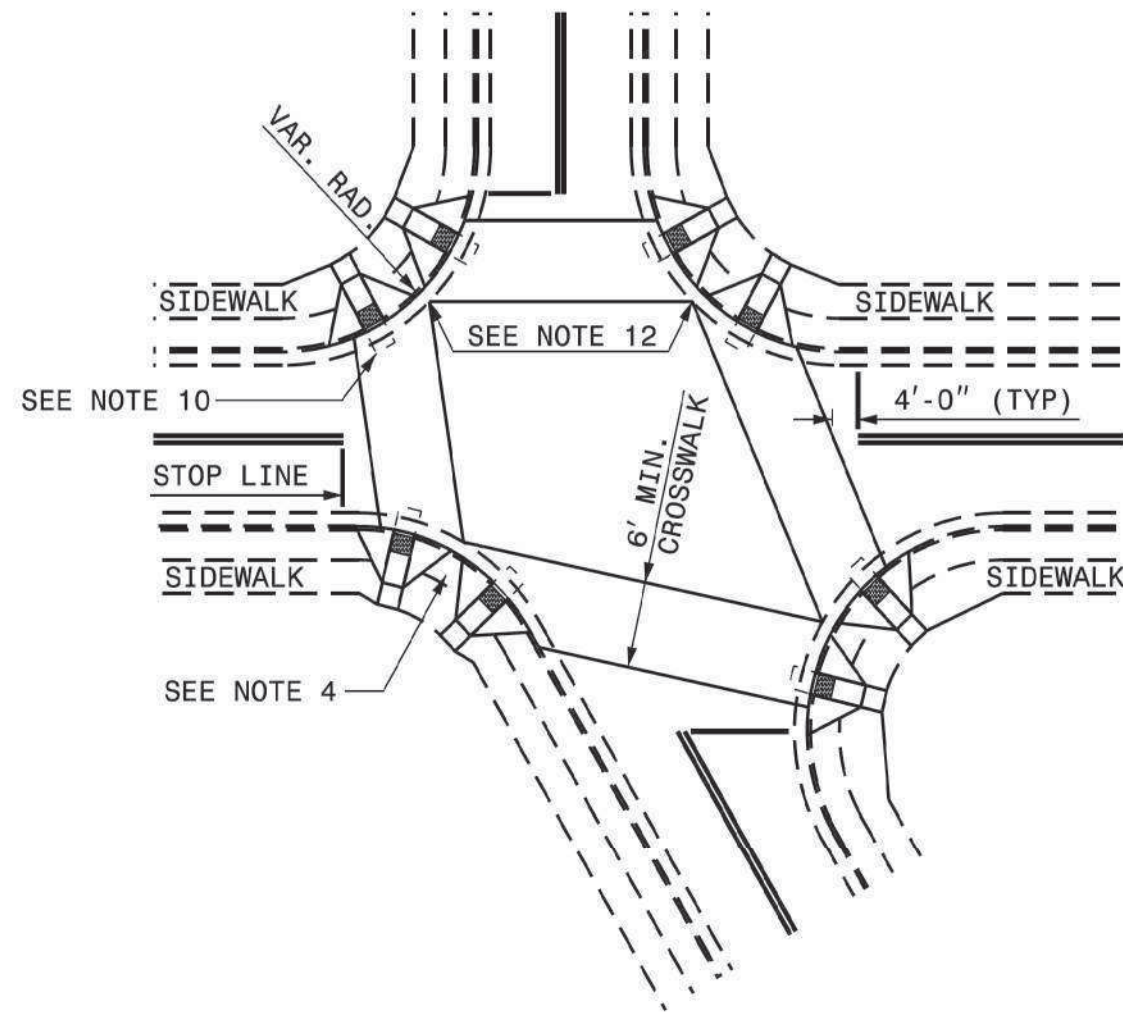
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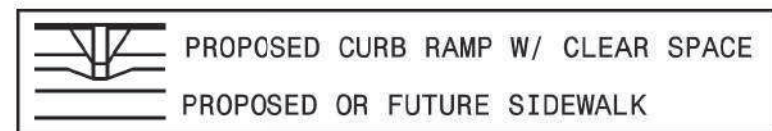
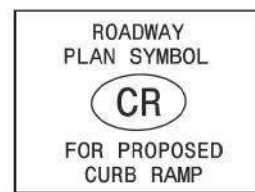
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KCI ASSOCIATES OF N.C., P.A.
4800 Falls of Peace Road, Suite 200
Raleigh, NC 27609
Phone (919) 783-4214
NC Firm License No. C-0704



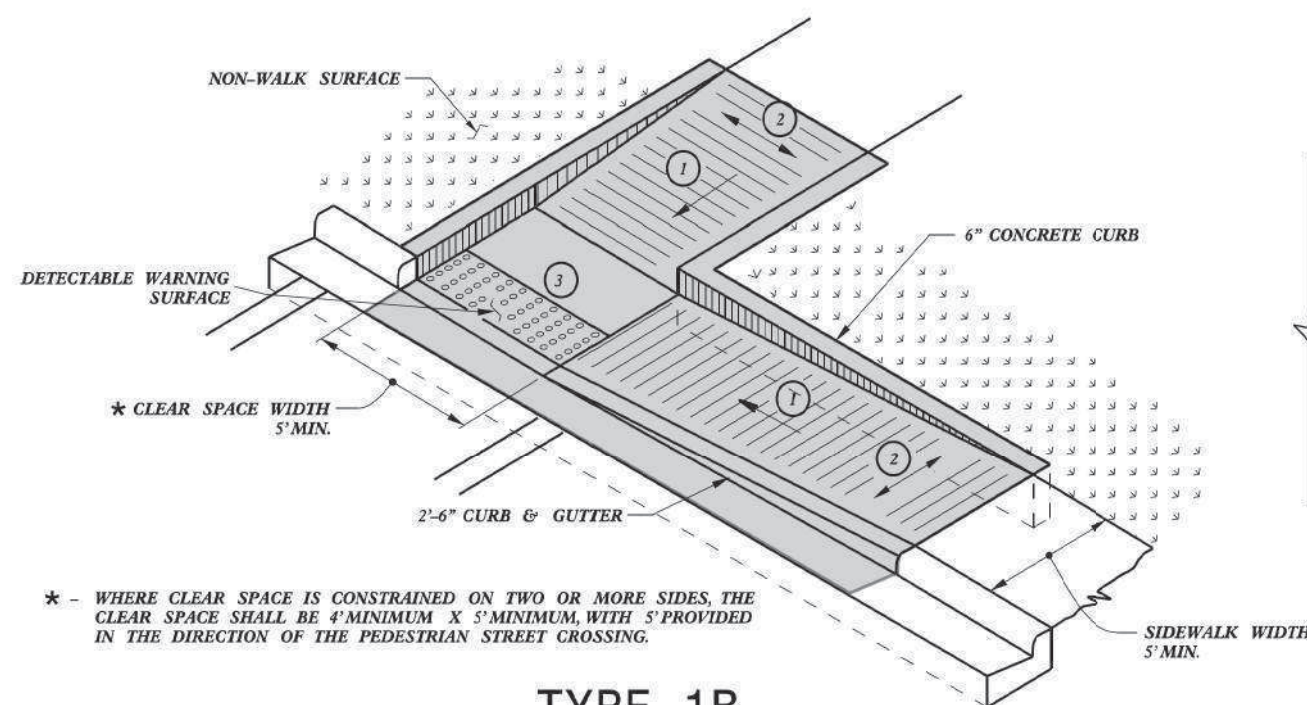
DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



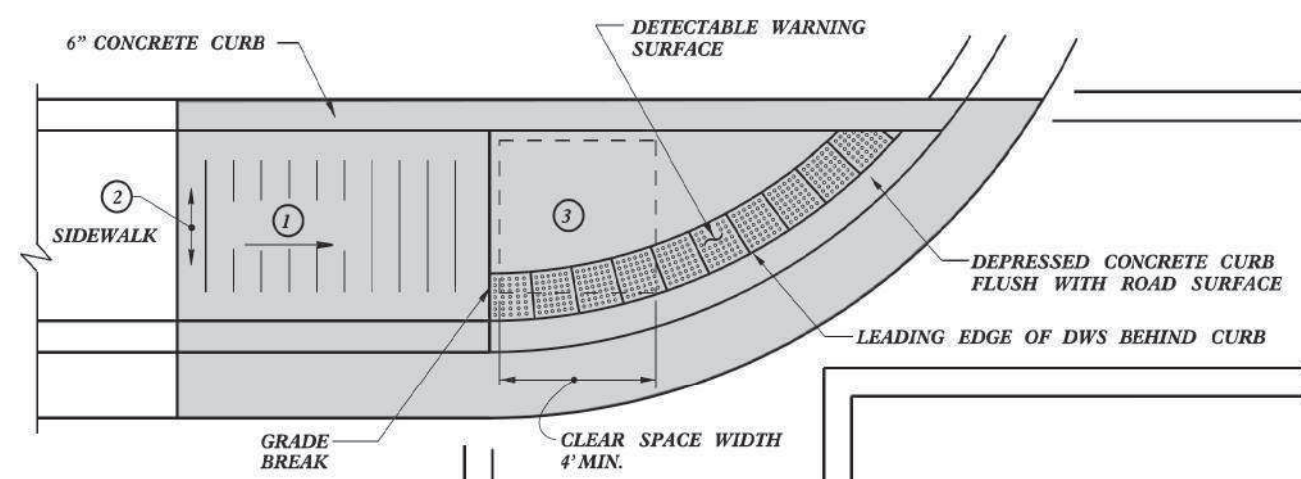
DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES



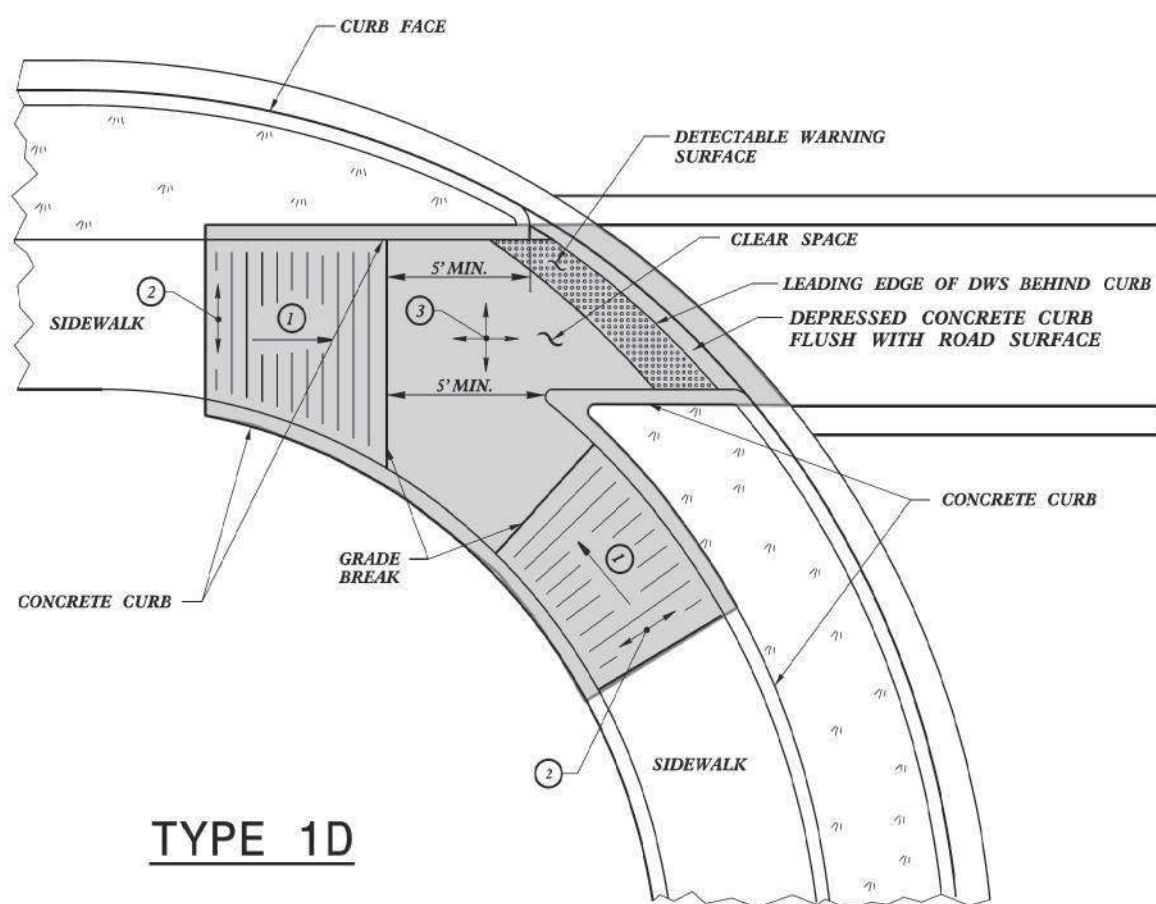
ALLOWABLE LOCATIONS
DUAL RAMP RADII.....ANY



TYPE 1B



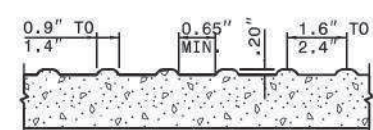
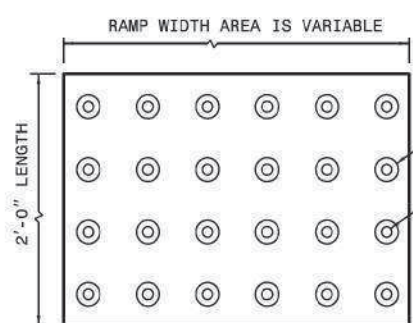
TYPE 1C



TYPE 1D

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%

NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING SURFACE

PAY LIMITS FOR 1 CURB RAMP

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

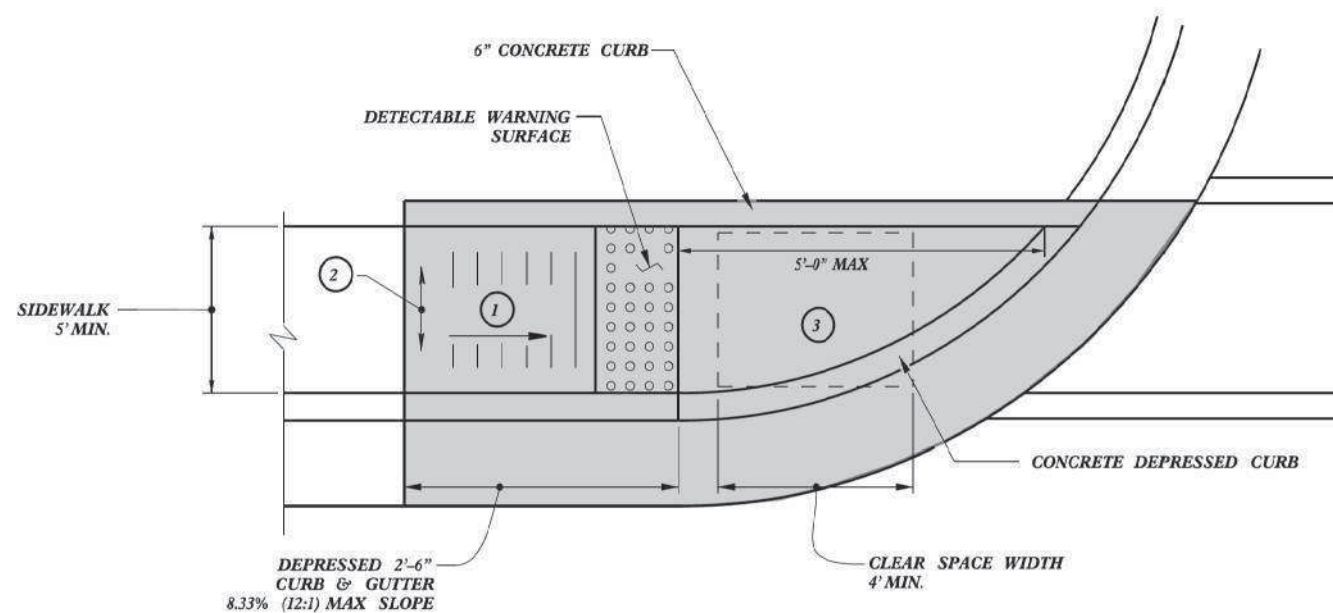
ROADWAY STANDARD DRAWING FOR
CURB RAMP
CURB RAMP LOCATION

SHEET 5 OF 13
848.06

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
DIRECTIONAL RAMP

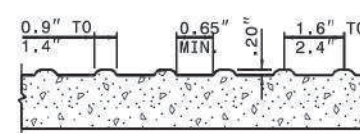
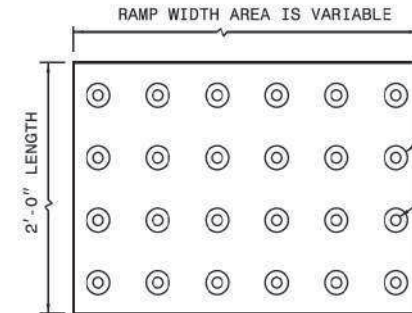
SHEET 7 OF 13
848.06



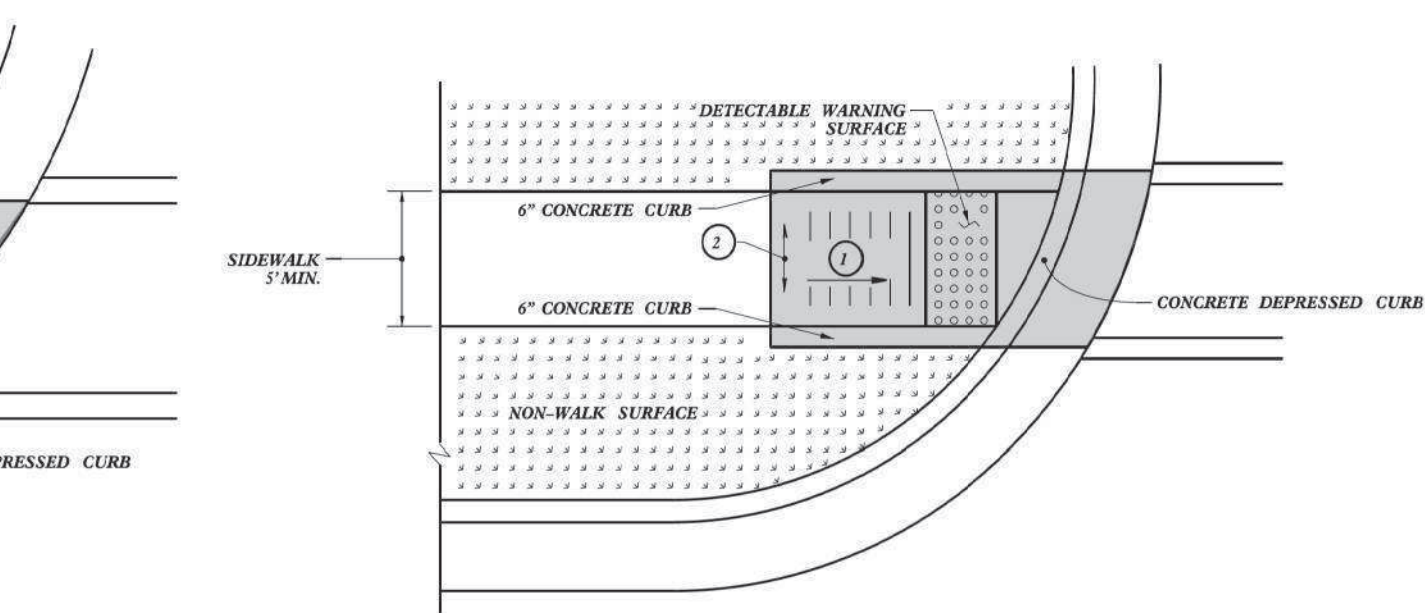
TYPE 1

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%

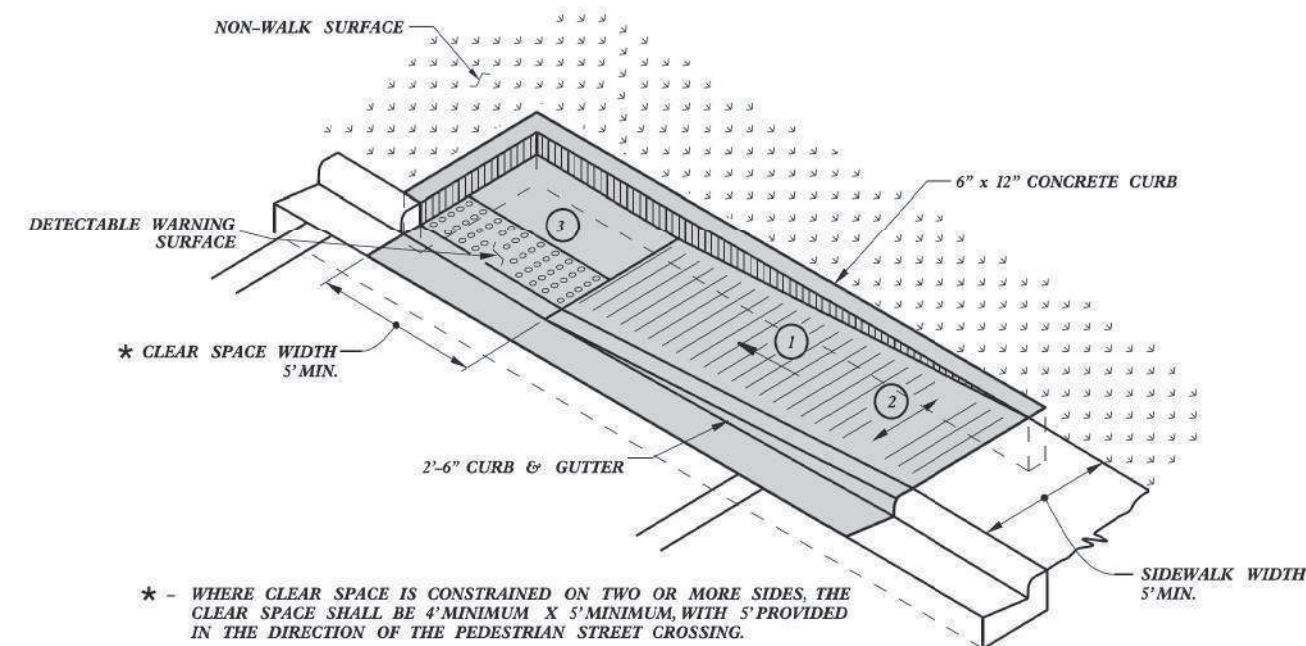
NOTES:
DETECTABLE WARNING SURFACE SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
DETECTABLE WARNING SURFACE SHALL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



DETECTABLE WARNING SURFACE



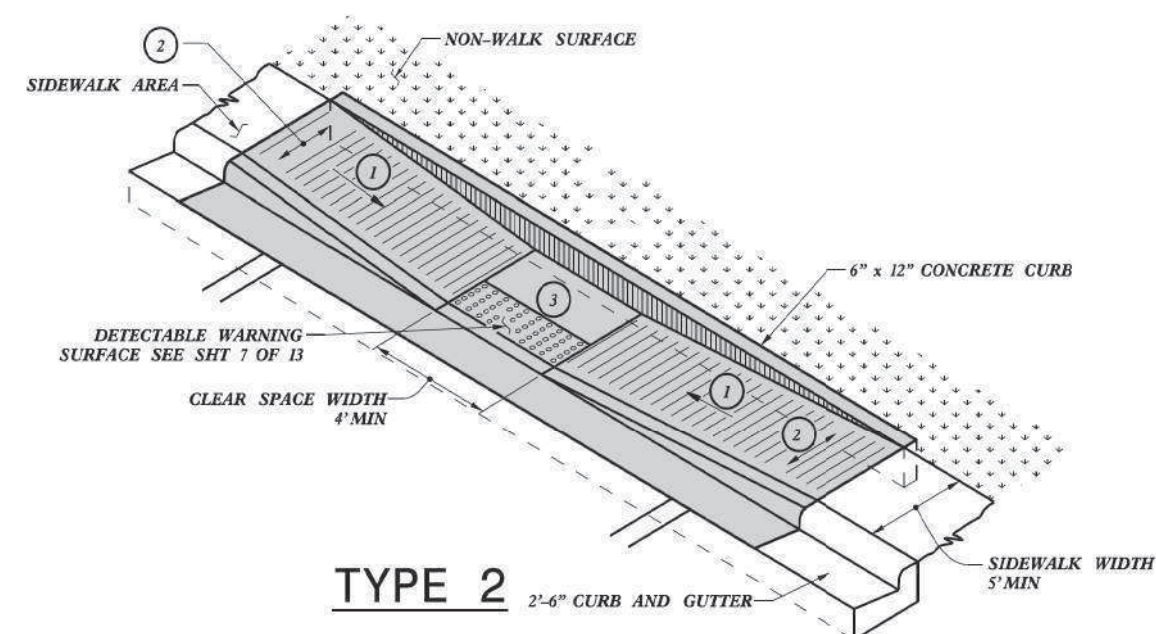
TYPE 1 MODIFIED



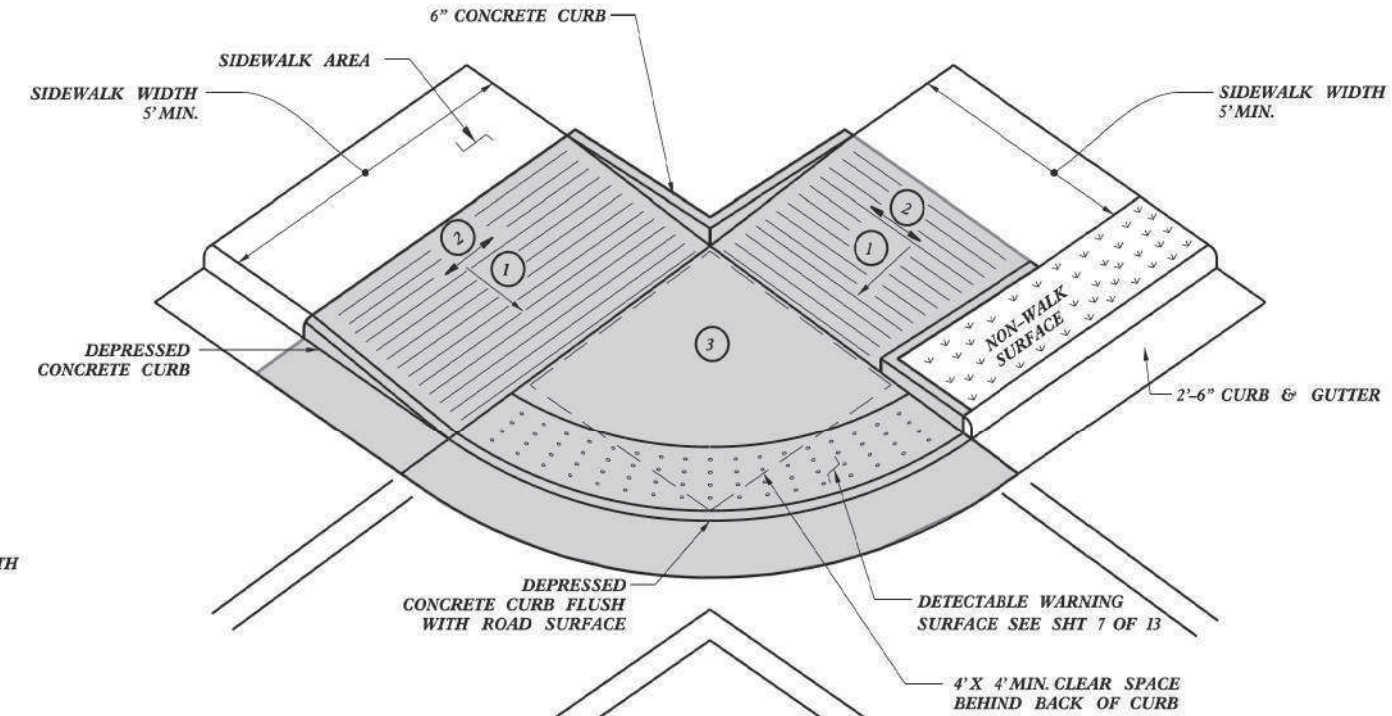
* - WHERE CLEAR SPACE IS CONSTRAINED ON TWO OR MORE SIDES, THE CLEAR SPACE SHALL BE 4' MINIMUM X 5' MINIMUM WITH 5' PROVIDED IN THE DIRECTION OF THE PEDESTRIAN STREET CROSSING.

TYPE 1A

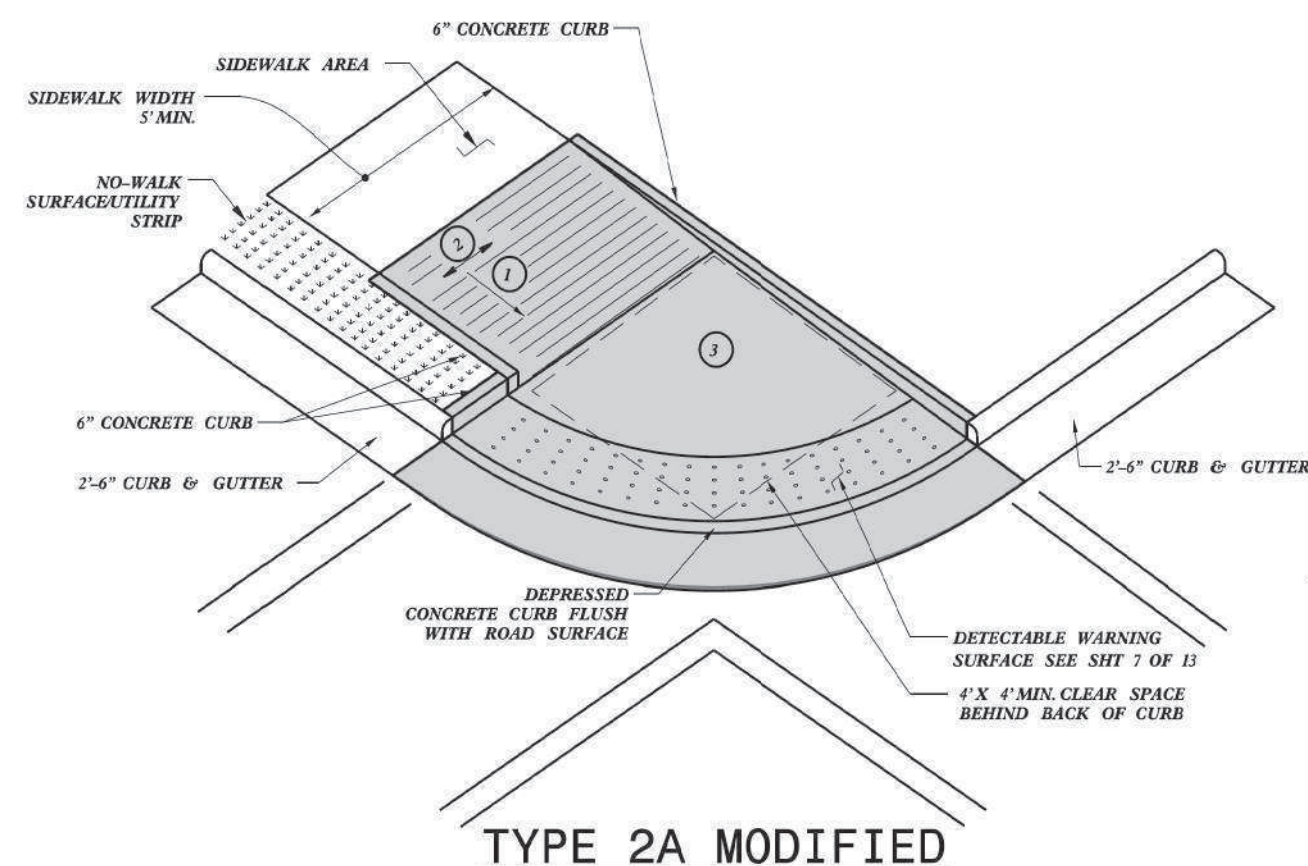
PAY LIMITS FOR 1 CURB RAMP



TYPE 2



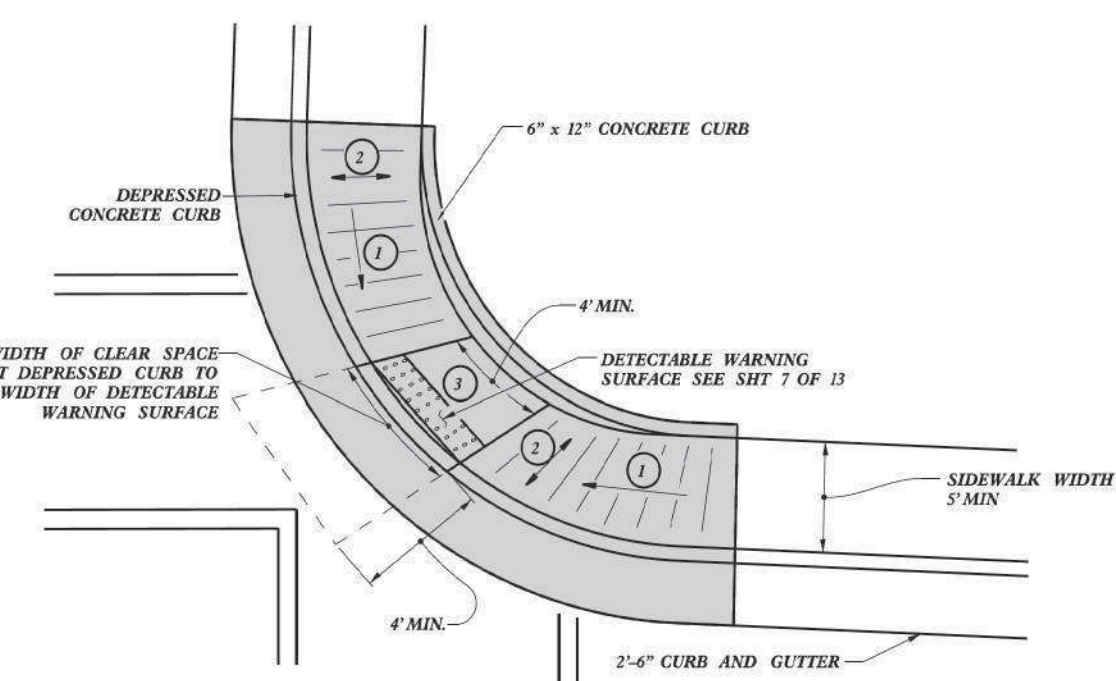
TYPE 2A



TYPE 2A MODIFIED

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00%

PAY LIMITS FOR 1 CURB RAMP



TYPE 2B

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
DIRECTIONAL RAMP

SHEET 6 OF 13
848.06

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
PARALLEL RAMP

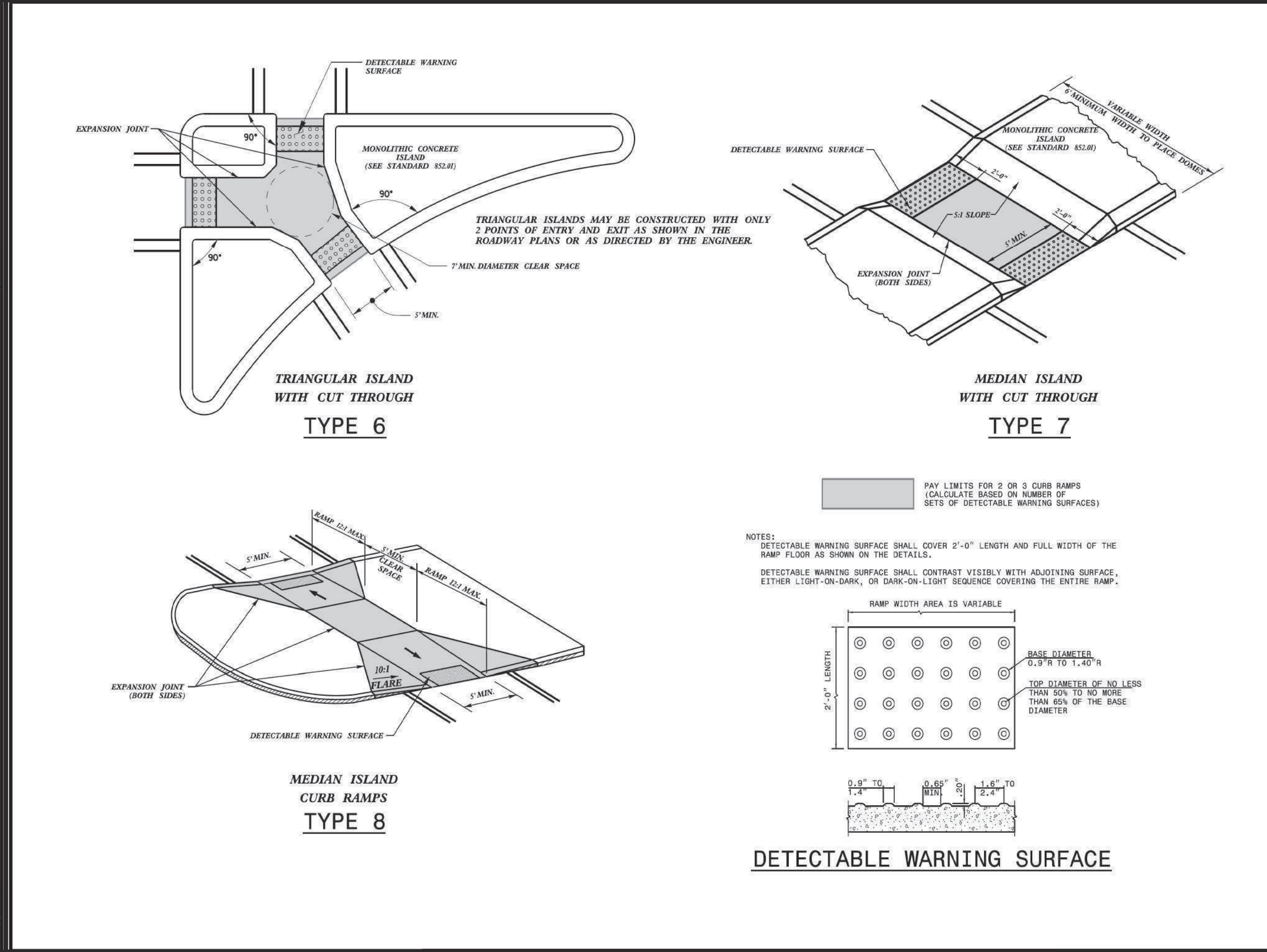
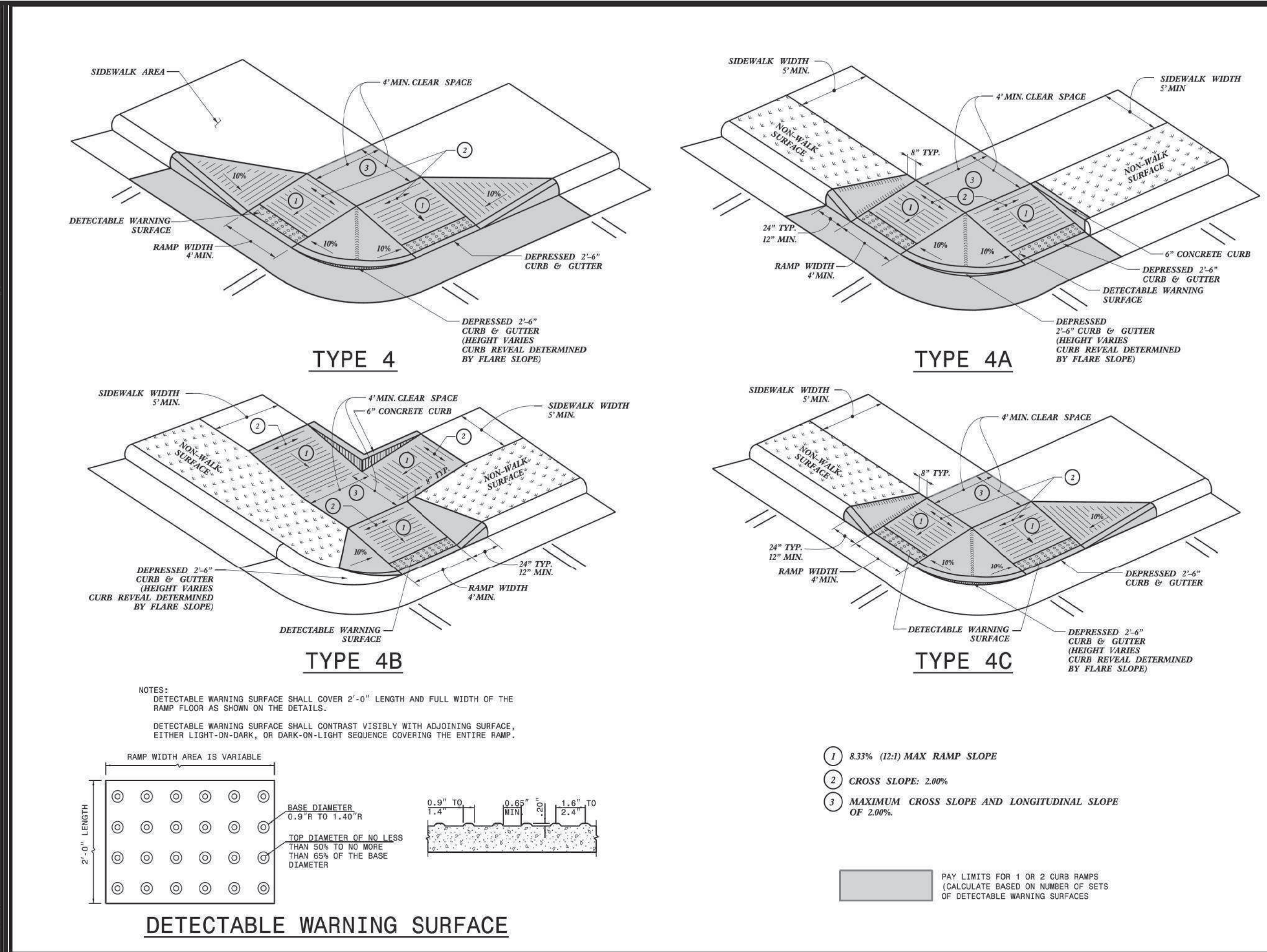
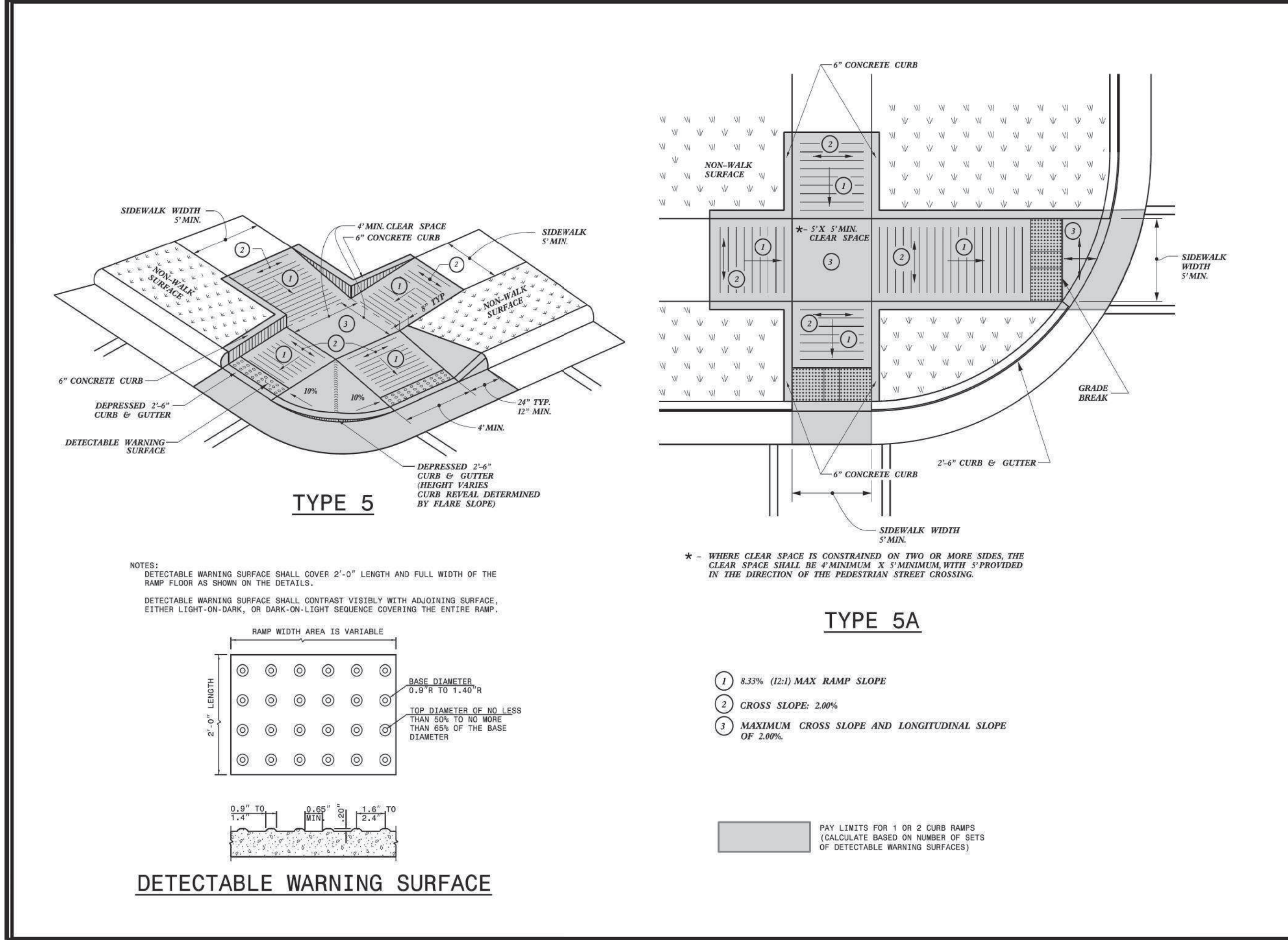
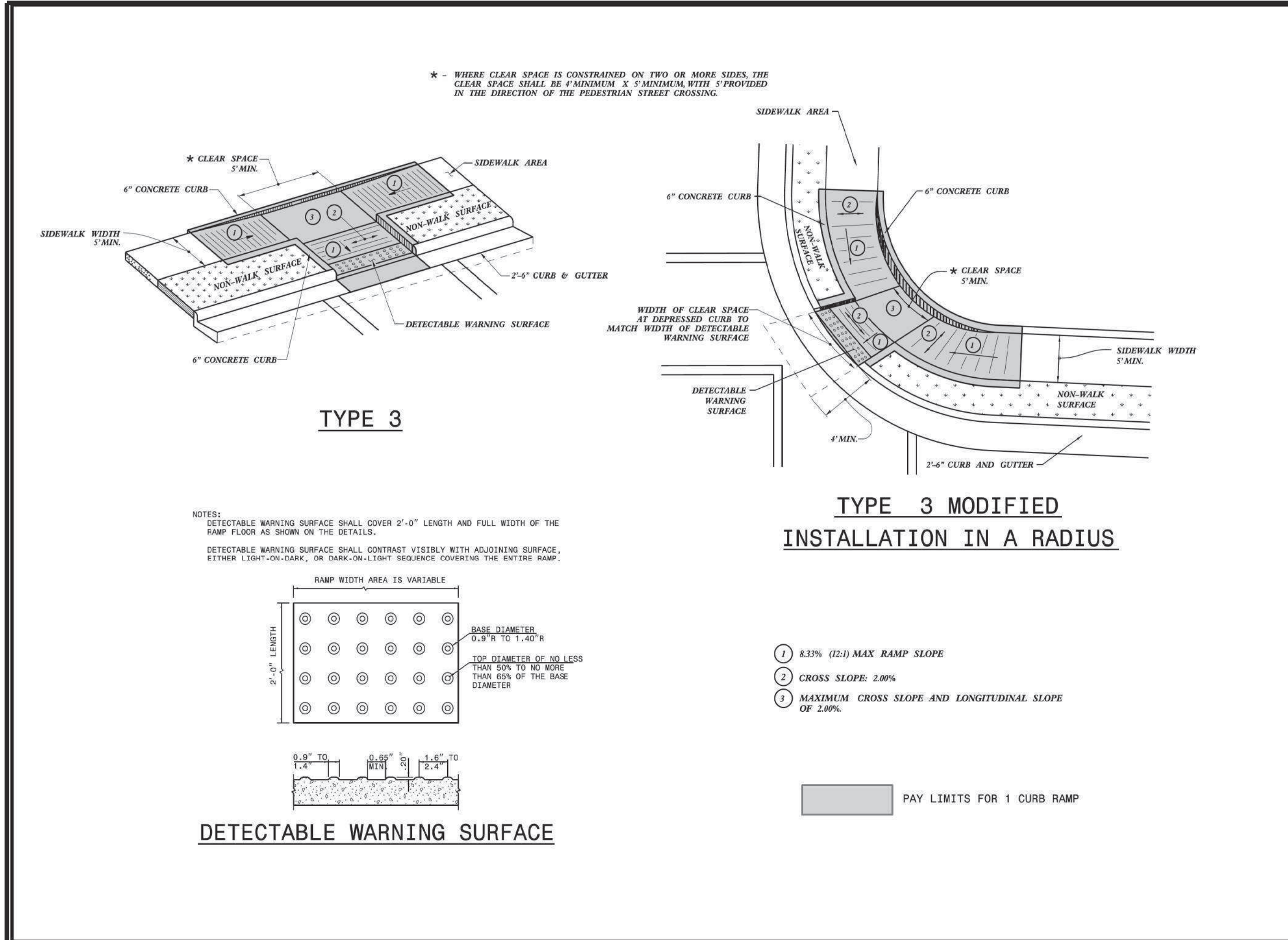
SHEET 8 OF 13
848.06

BN-0031KB
2C-2
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN UNIT

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NC Firm License No. CA704



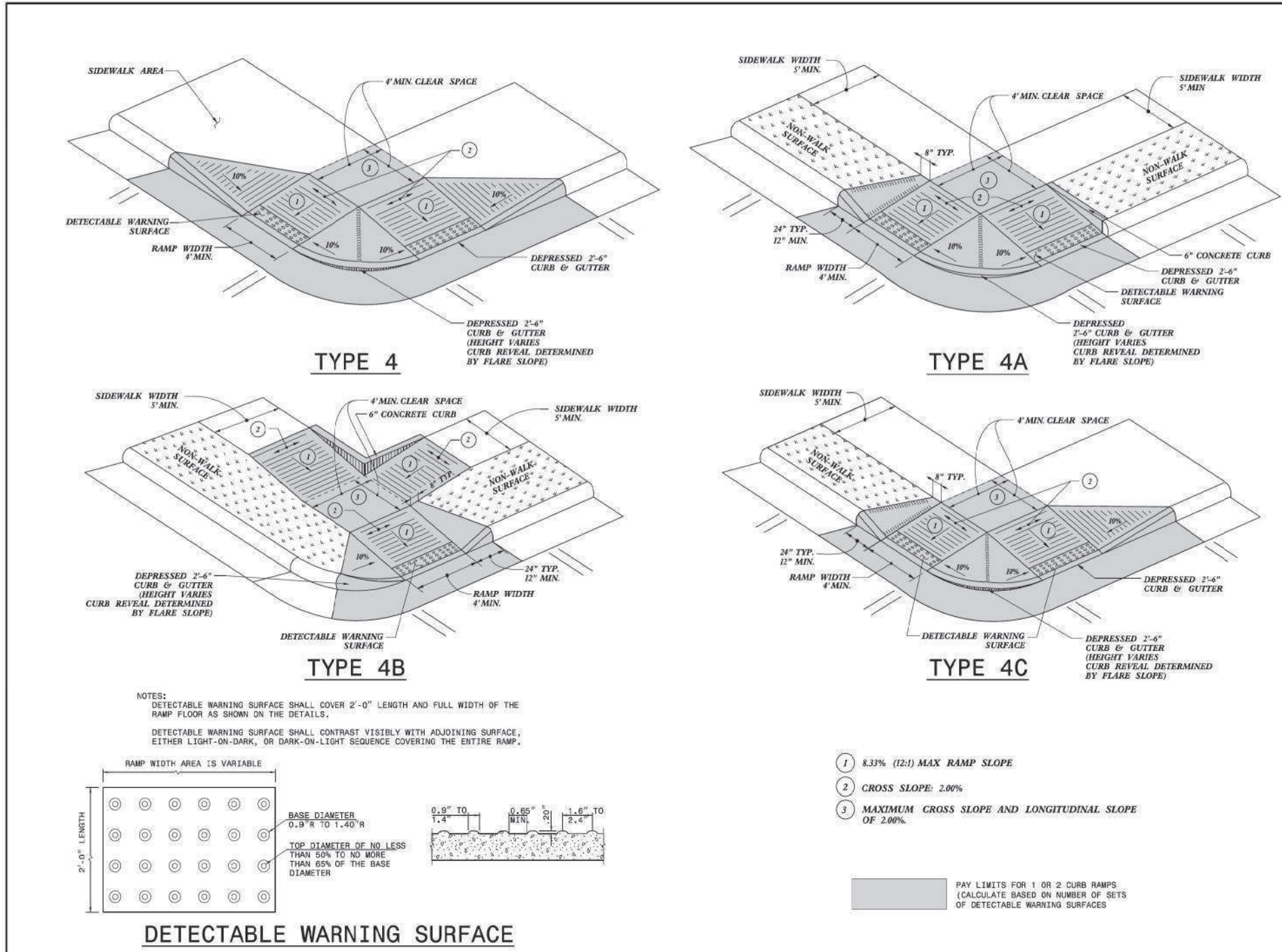
NOTES:

1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
6. TERMINATE PARKING A MINIMUM OF 20' FROM THE BACK OF PEDESTRIAN CROSSWALK.
7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.
9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
12. CONSTRUCT CLEAR SPACES FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT CLEAR SPACES FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. IF CONSTRAINED ON TWO OR MORE SIDES, THE CLEAR SPACE SHALL BE 4' MINIMUM X 5' MINIMUM, WITH 5' PROVIDED IN THE DIRECTION OF THE PEDESTRIAN STREET CROSSING.
13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGH THE ISLAND.
14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'x5' CLEAR SPACE AT THE TOP OF RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, WHERE THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE, OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01.
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
18. DETECTABLE WARNING SURFACES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
19. DETECTABLE WARNING SURFACES WILL CONTRAST VISIBLY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
NOTES

SHEET 13 OF 13
848.06



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
CURB RAMP
SHARED LANDING

SHEET 10 OF 13
848D06



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CONTRACTS STANDARDS
AND DEVELOPMENT UNIT
Office 919-707-0950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: S. CALHOUN DATE: 12-22-2023
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC: 3 SPECIAL DETAILS/COMPANION 848D0610.DWG

BN-0031KB

2C-4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

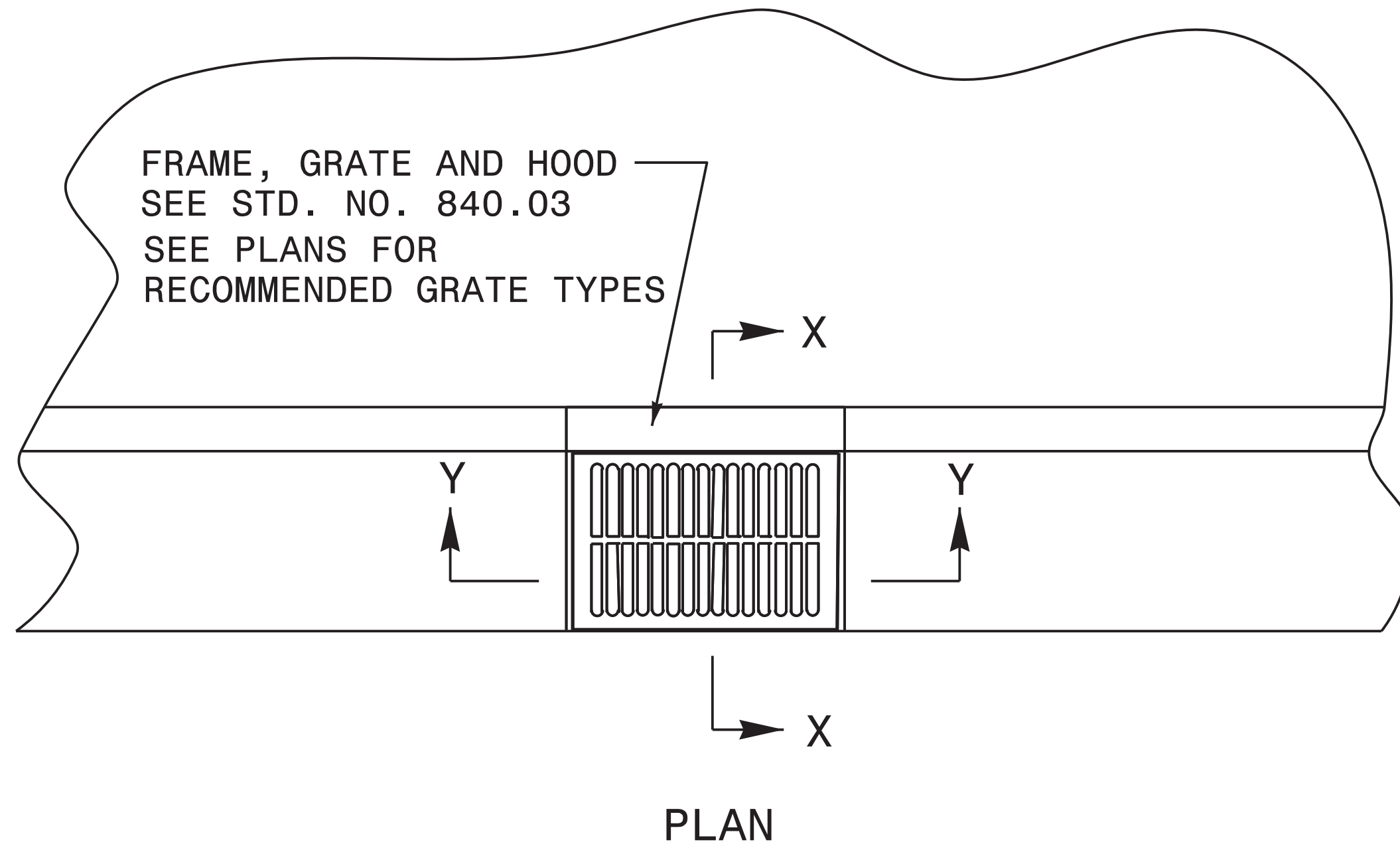
ROADWAY DESIGN UNIT

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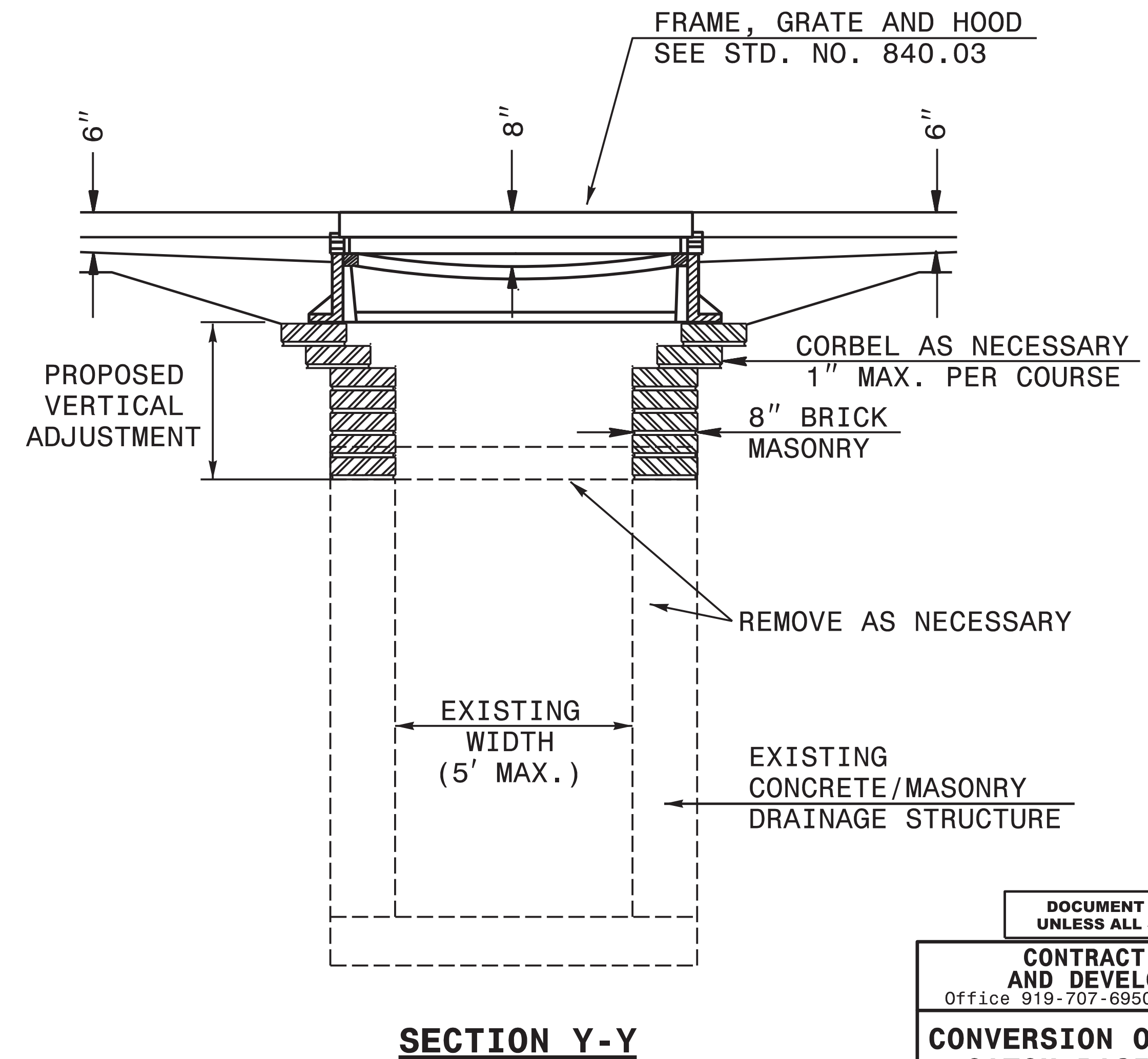
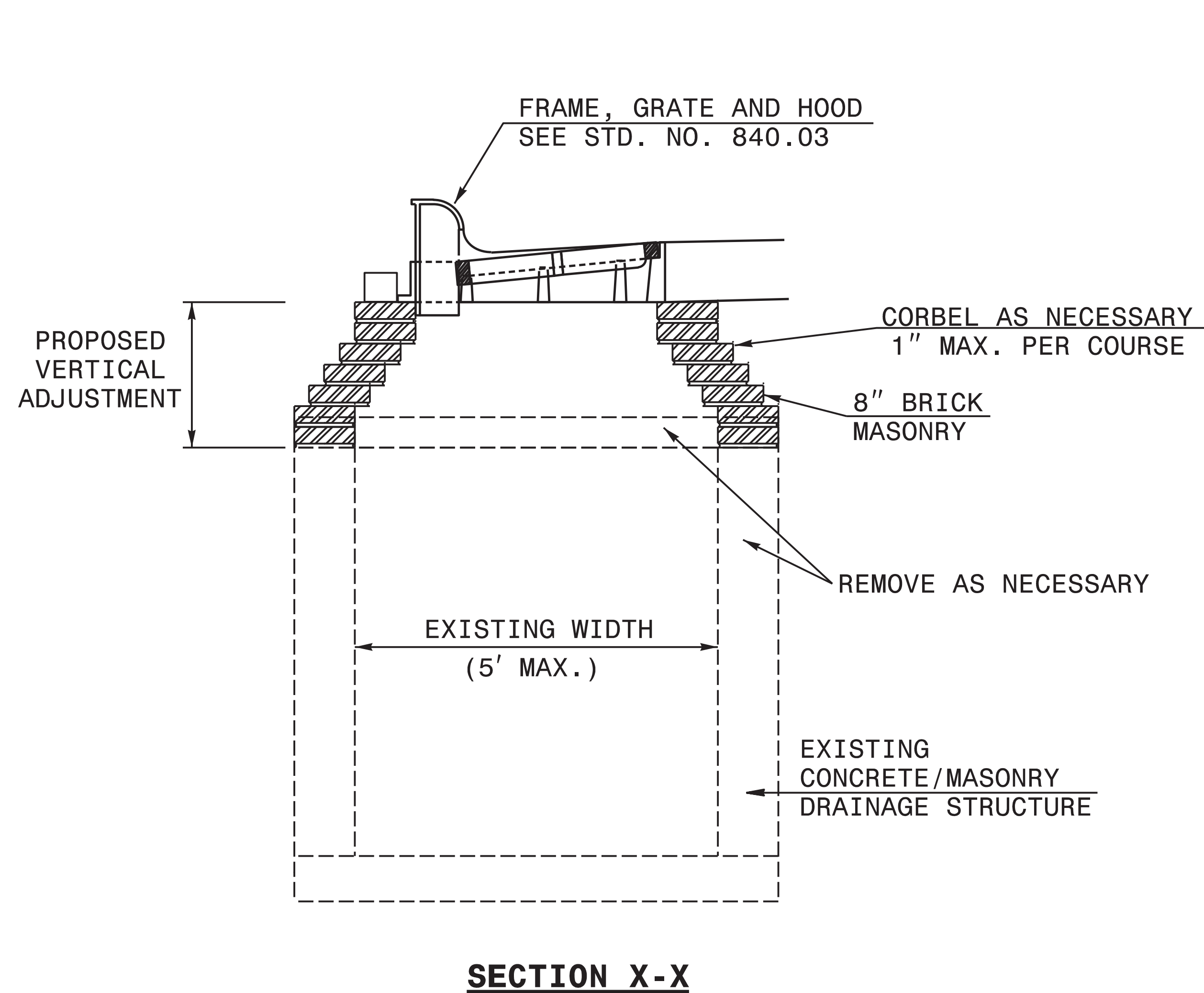


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Raleigh, NC 27609
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GENERAL NOTES:

- THE ROADWAY PLANS INDICATE STRUCTURES TO BE CONVERTED.
- AFTER REMOVAL, GRATES AND FRAMES SHALL BE STORED AS DIRECTED BY THE ENGINEER.
- 4" SOLID CLAY BRICK, JUMBO BRICK, CONCRETE, OR 4" SOLID CONCRETE BLOCK MAY BE USED FOR VERTICAL ADJUSTMENT OF THE STRUCTURE.
- ALL CONVERSIONS SHALL BE IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

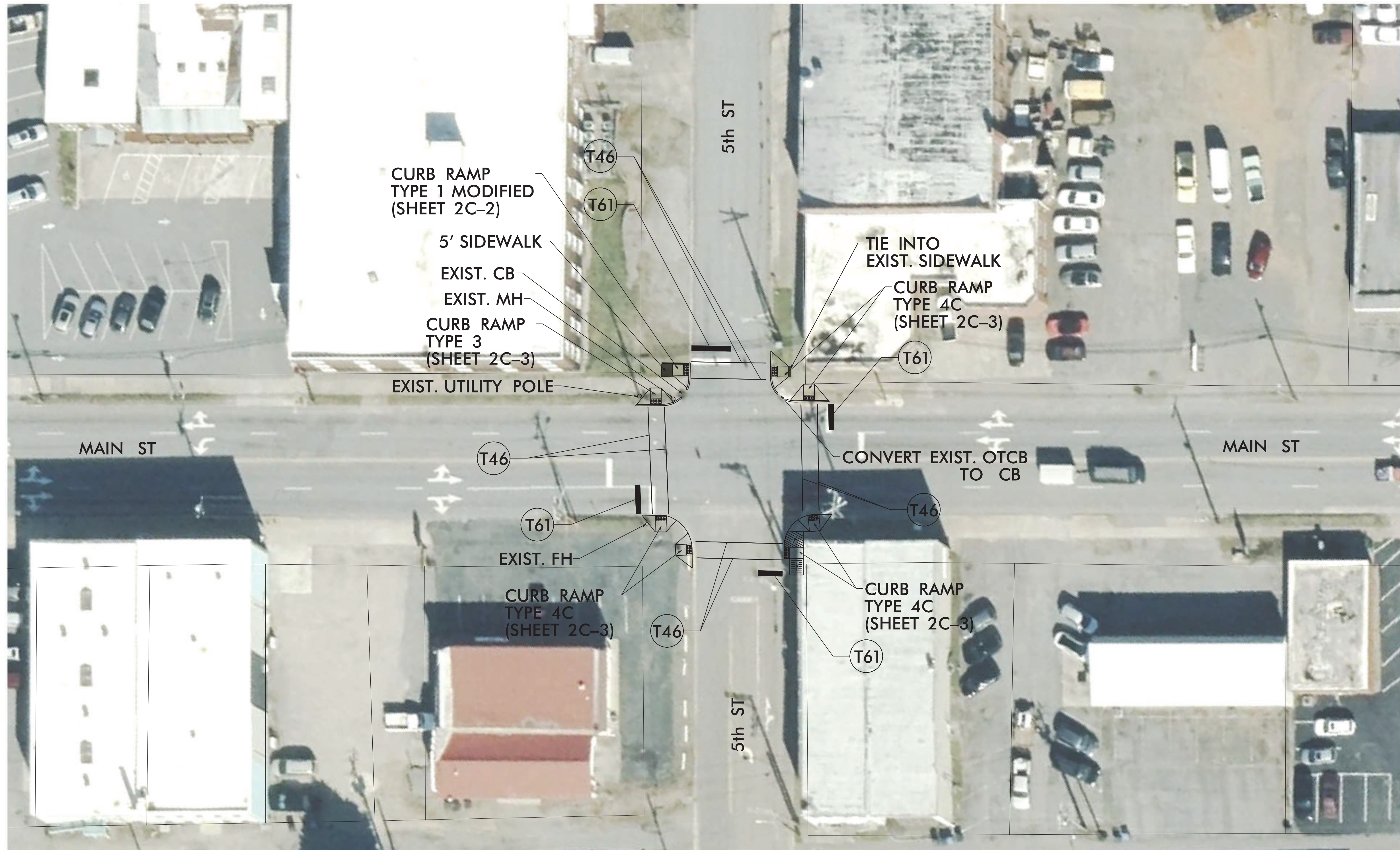


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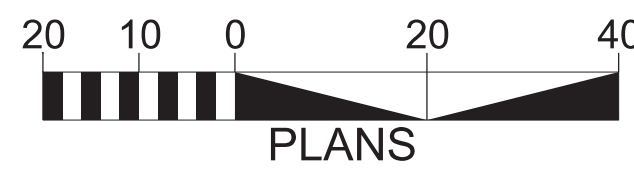
CONTRACT STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-6950	FAX 919-250-4119
CONVERSION OF OPEN THROAT CATCH BASIN TO HOODED CATCH BASIN (STD. 840.02)	
ORIGINAL BY: E.E. WARD	DATE: 11-97
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: s:\usr\details\stand\jbtocb.dgn	

TAP 120 SITE 1 (11-0903)

US 421 BUS (MAIN STREET) AND 5TH STREET



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



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4

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER

7/22/2026

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TAP 120 SITE 2 (11-0904)

US 421 BUS (MAIN STREET) AND 6TH STREET



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5

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
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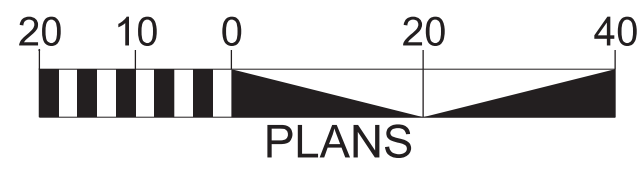


TAP 120 SITE 3 (11-0914)

US 421 BUS (D STREET) AND 6TH STREET



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



BN-0031KB

6

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER

7/22/2026

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TAP 121 SITE 1 (11-0073) US 421 BUS (D STREET) AND NC 18-268 (CDB LOOP)



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



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7

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER

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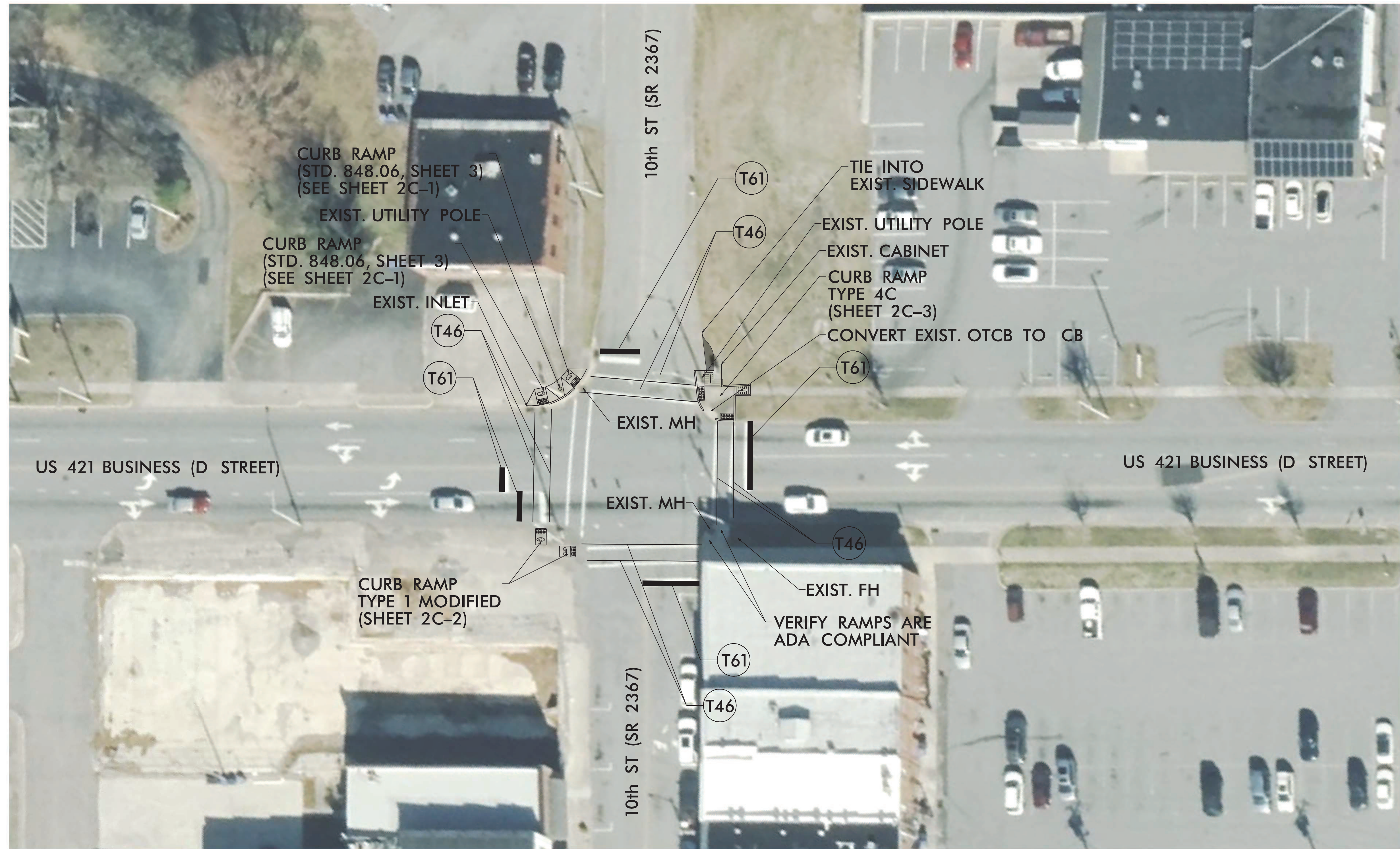
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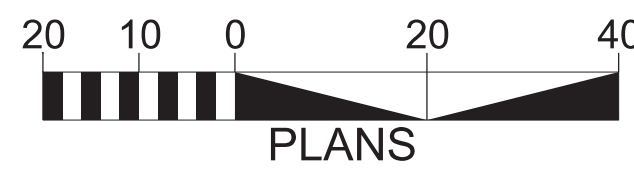
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Raleigh, NC 27609
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TAP 121 SITE 2 (11-0910)

US 421 BUS (D STREET) AND 10TH STREET (SR 2367)



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



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8

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WILKES COUNTY

ROADWAY DESIGN UNIT
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TAP 121 SITE 3 (11-0912)

US 421 BUS (D STREET) AND 9TH STREET



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



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9

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WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
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TAP 121 SITE 4 (11-0913)

US 421 BUS (D STREET) AT 8TH STREET



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.



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10

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DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

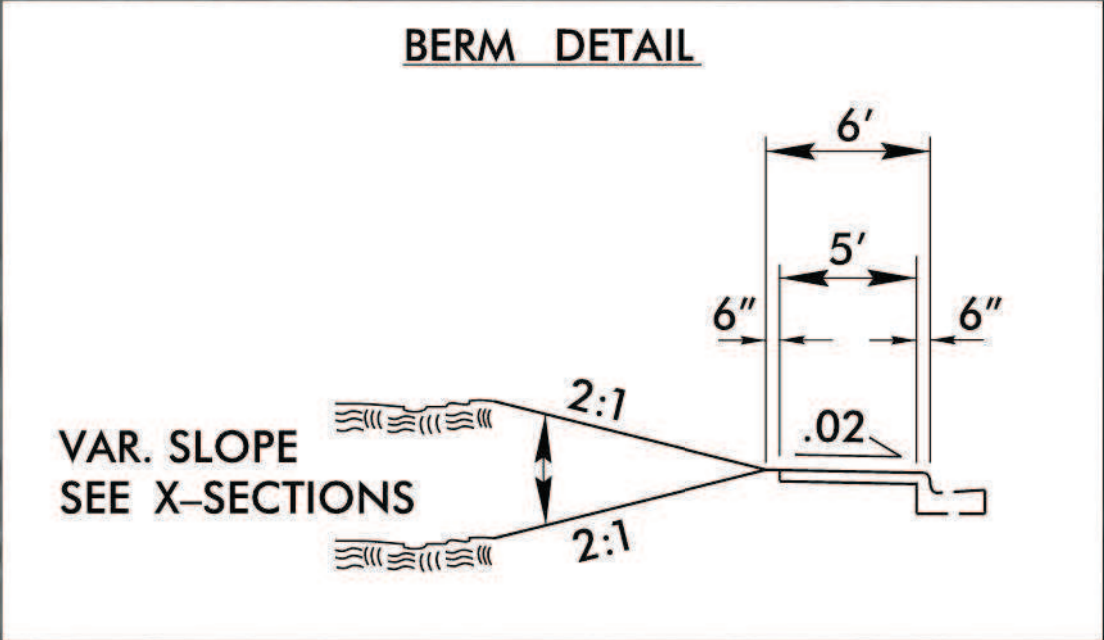
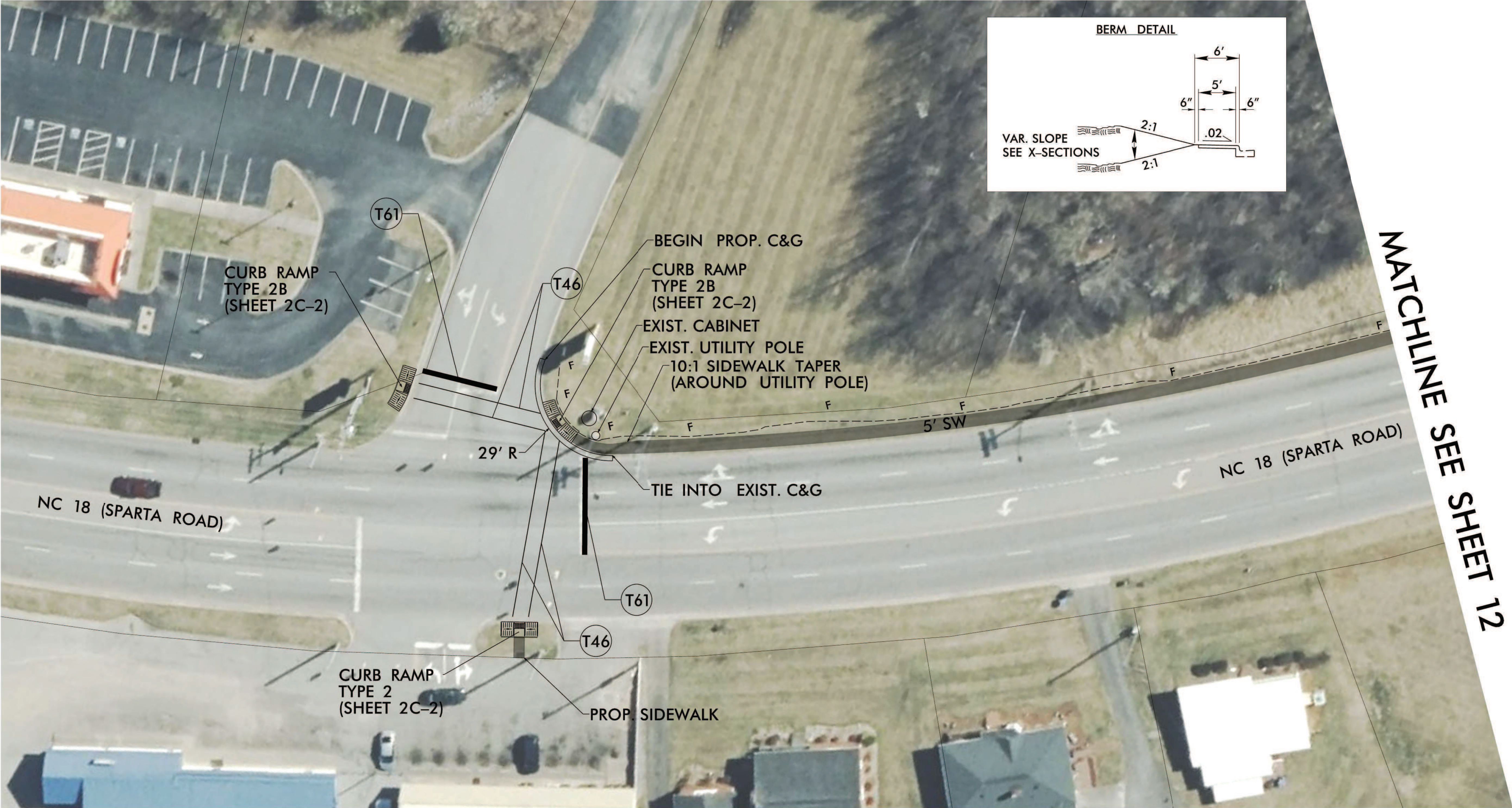
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TAP 122 SITE 1 (11-0090) NC 18 (SPARTA ROAD) AND PIZZA HUT/VILLAGE MARKET SHOPPING CENTER



MATCHLINE SEE SHEET 12



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.

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DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

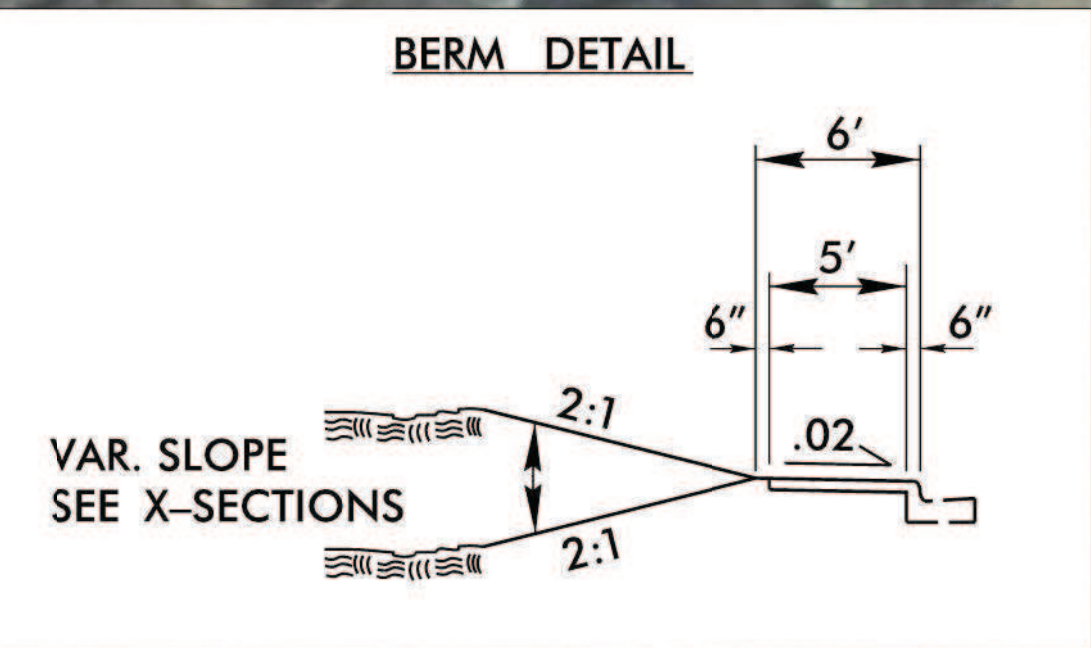
7/22/2026

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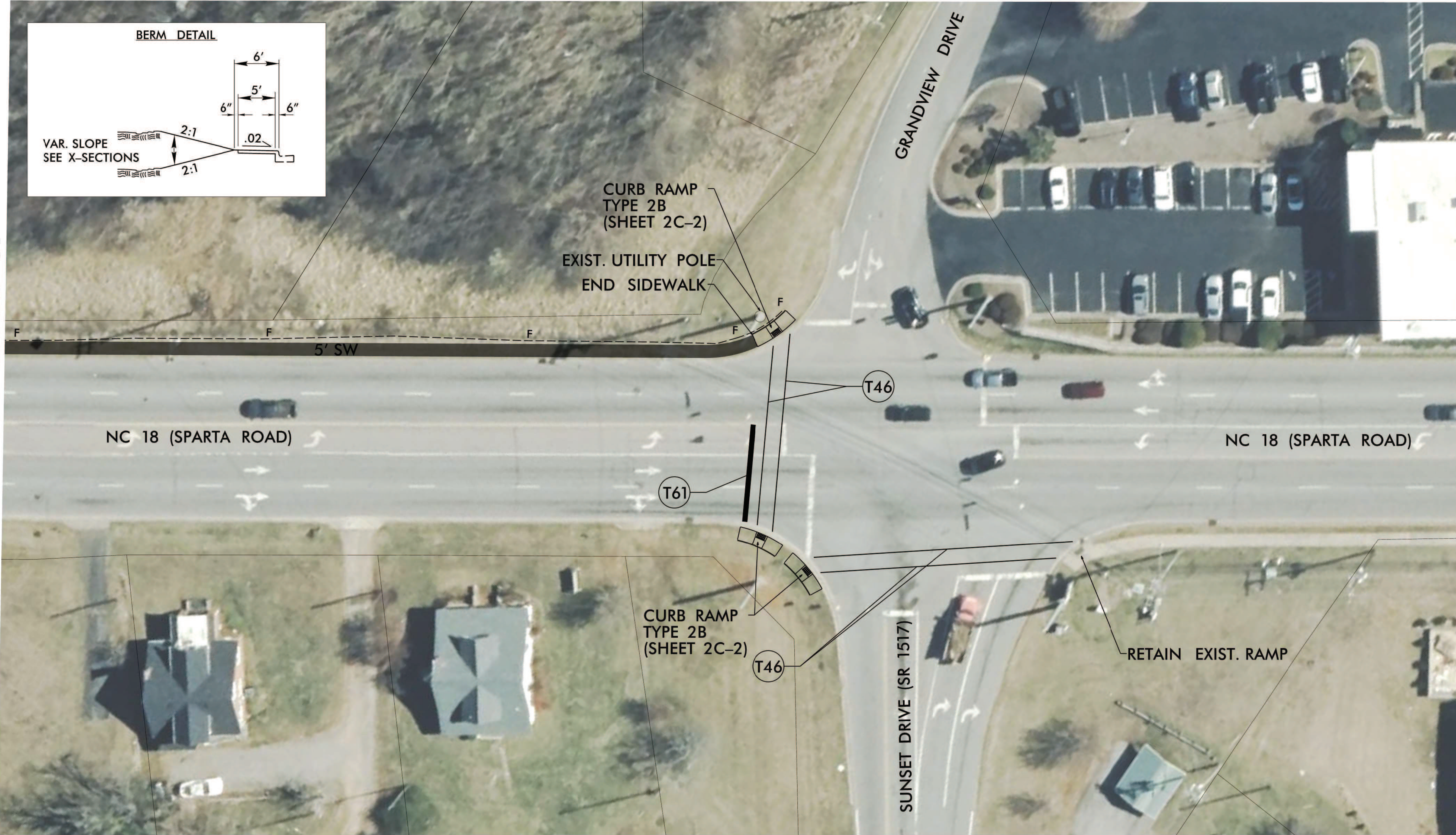
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NC Firm License No. C-4784

TAP 122 SITE 2 (11-1120) NC 18 (SPARTA ROAD) AT SUNSET DRIVE (SR 1517) AND GRANDVIEW DRIVE



MATCHLINE SEE SHEET 11



NOTE: DESIGN IS BASED OFF OF AERIAL IMAGERY.

BN-0031KB

12

NORTH CAROLINA
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WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

PROFESSIONAL
SEAL
053669
ENGINEER
7/22/2026

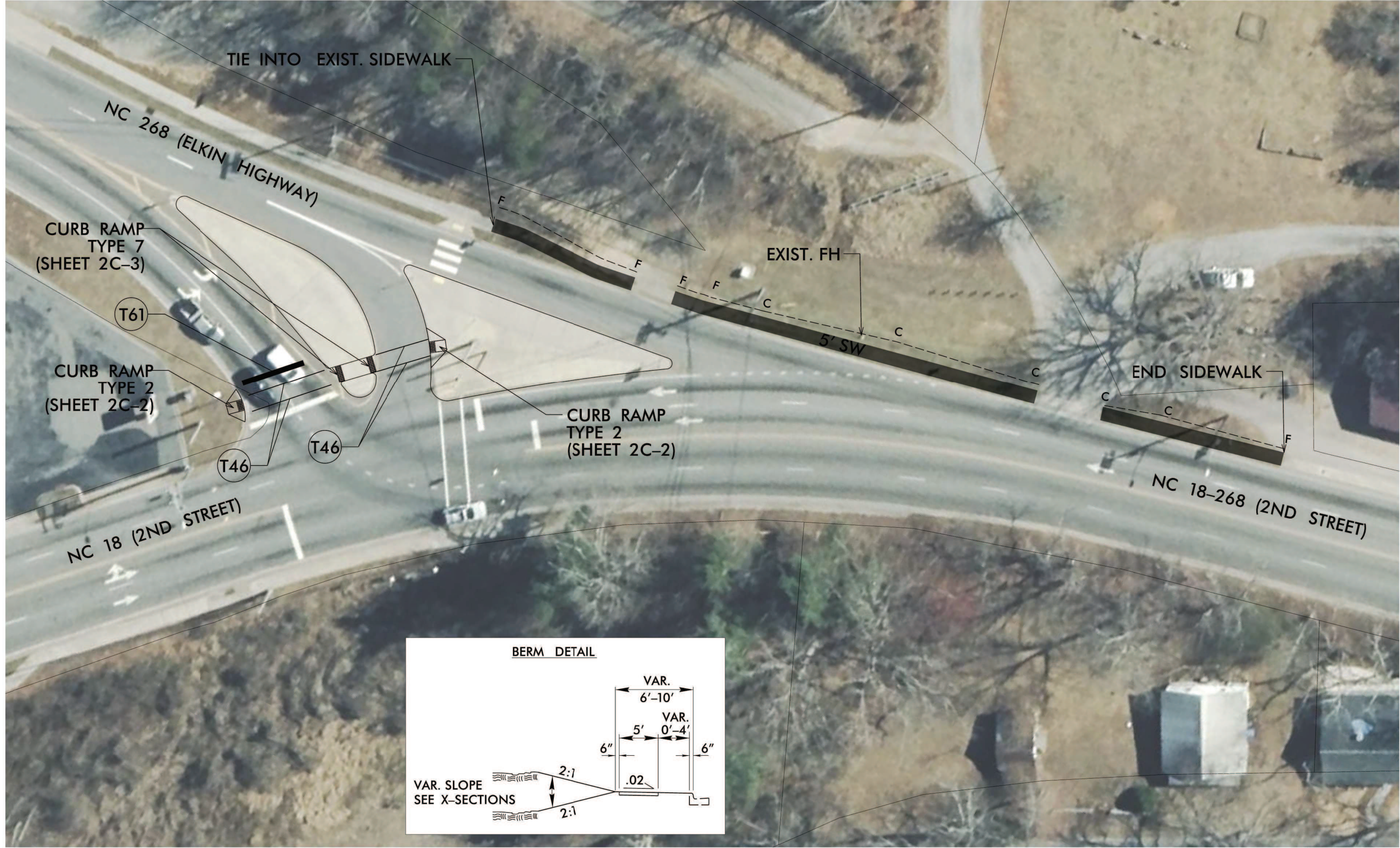
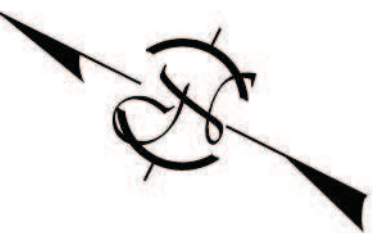
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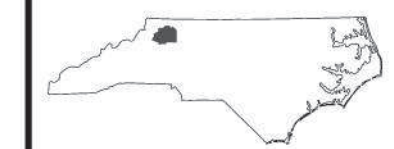
TAP 122 SITE 3 (11-0941) NC 18-268 /NC 18 (2ND STREET) AND NC 268 (ELKIN HIGHWAY)



BN-0031KB

13

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER



7/27/2026

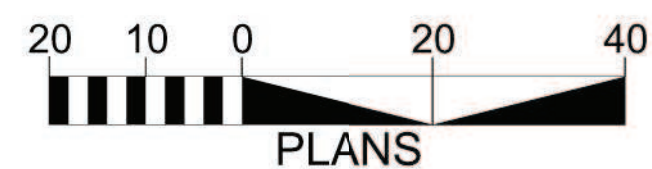
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TAP 122 SITE 4 (11-0942) NC 18-268 (2ND STREET) AT BOSTON AVENUE AND M STREET



BN-0031KB

14

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

PROFESSIONAL
SEAL
053669
ENGINEER

7/27/2026

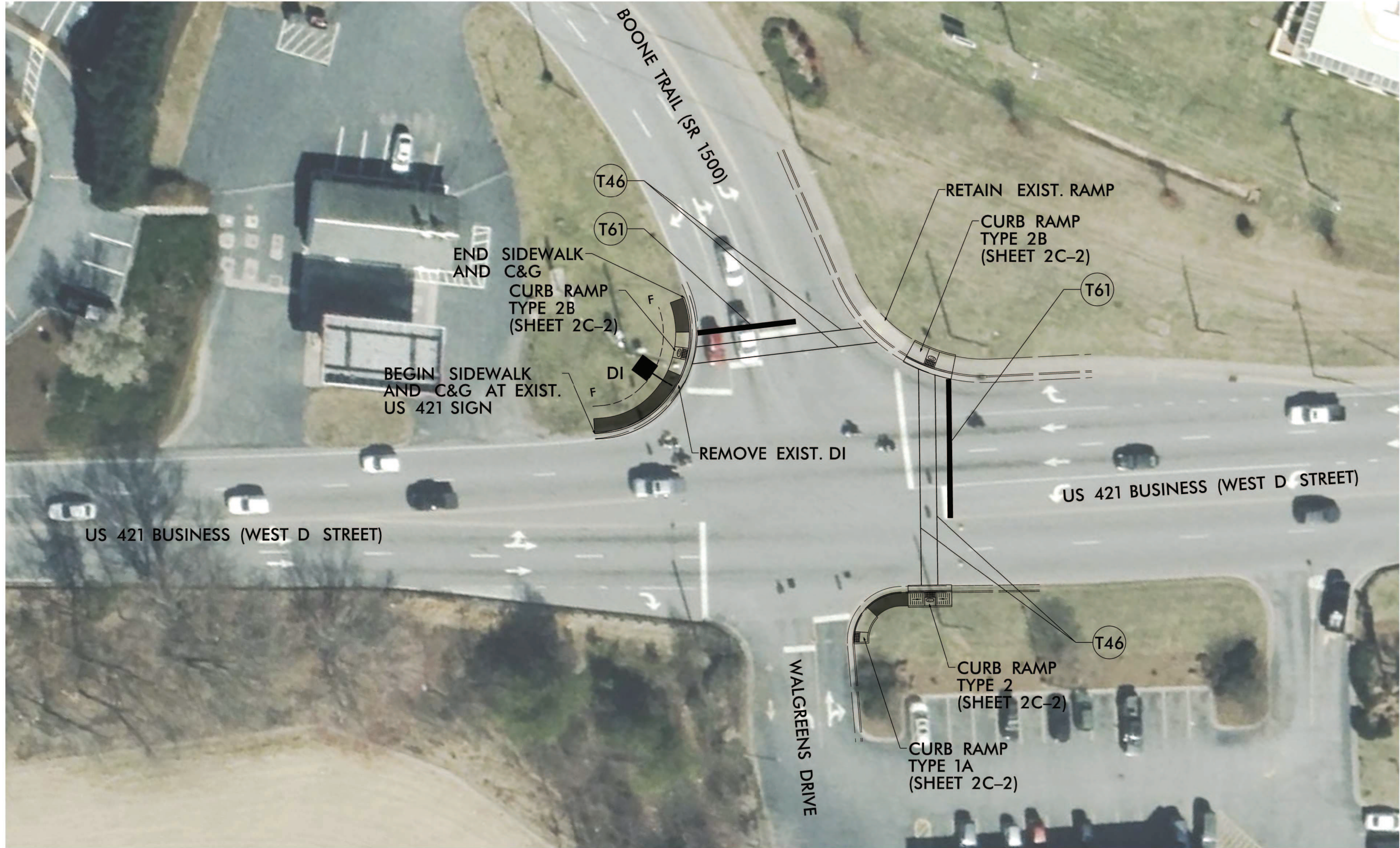
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TAP 123 (11-0927) US 421 BUSINESS (WEST D STREET) AND BOONE TRAIL (SR 1500)



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NORTH CAROLINA
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WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER

PROFESSIONAL
SEAL
053669
ENGINEER
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TAP 129 SITE

WILKESBORO AVE (SR 2366) AND 9TH STREET



BN-0031KB

16

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WILKES COUNTY

ROADWAY DESIGN UNIT
ROADWAY DESIGN
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	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

	12"	Accessible Pedestrian Signal		16"
21,22 41,42 61,62 81,82		P21,P22 P41,P42 P61,P62 P81,P82		

TABLE OF OPERATION			
SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLASH
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN	NEW CARD
2A	6X40	0	*	*	2	-	-	X	-	X	-
2B	6X40	0	*	*	2	-	-	X	-	X	-
4A	6X40	0	*	*	4	5.0	-	X	-	X	-
6A	6X40	0	*	*	6	-	-	X	-	X	-
6B	6X40	0	*	*	6	-	-	X	-	X	-
8A	6X40	0	*	*	8	3.0	-	X	-	X	-
8B	6X40	0	*	*	8	10.0	-	X	-	X	-

* Multi-zone microwave detection

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Install new 2070LX controller in existing cabinet.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. See Roadway Design Plans for crosswalk and curb ramp locations.

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Non-Intrusive Detection Zone	

MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	7	7	7	7
Ped Clear	7	9	6	9
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	36	12	36	12
Yellow Change	4.2	4.2	4.2	4.2
Red Clear	2.1	2.1	2.1	2.1
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	4	4	5	4
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Start **	X	X	X	X

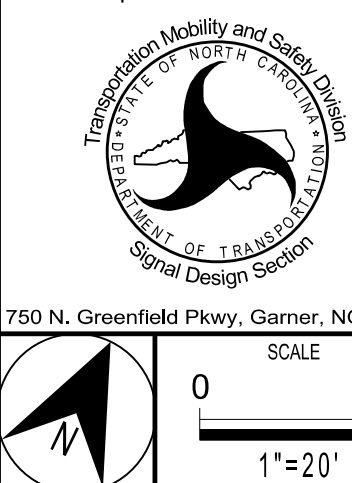
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.

**** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.**

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Fifth Street.
PB23	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Fifth Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
PB43	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Fifth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Fifth Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.

Prepared for the Offices of:



AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

US 421 Business (Main Street)
at
Fifth Street

Division 11 Wilkes County North Wilkesboro

PLAN DATE:	May 2026	REVIEWED BY:	R. Garrett
------------	----------	--------------	------------

PREPARED BY:	X. Han	REVIEWED BY:
--------------	--------	--------------

REVISIONS	INIT.	D

.....

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



Seal of the Professional Engineer, State of North Carolina. The seal is circular with "NORTH CAROLINA" at the top and "PROFESSIONAL ENGINEER" around the bottom. In the center, it says "SEAL 056268" and "XUDONG HAN".

Signed by: Xudong Han 6/3/2026

DATE

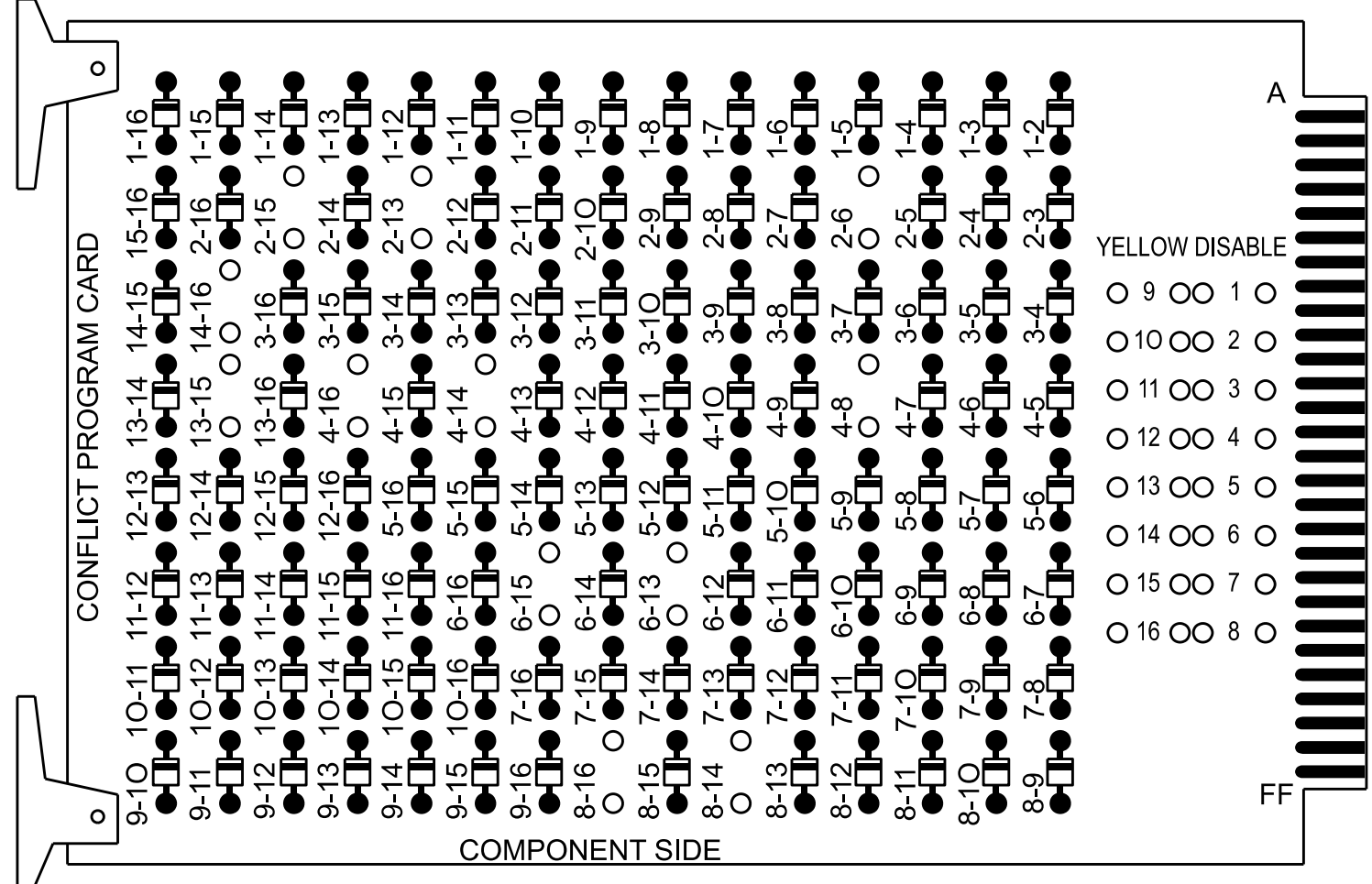
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HONG

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 6-13, 6-15, 8-14, 8-16, 13-15 AND 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Program phases 2, 4, 6 and 8 for Simultaneous Start.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-13-TBS North Wilkesboro System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....336
Software.....Q-Free MAXTIME
Cabinet Mount.....Pole
Output File Positions.....12
Load Switches Used.....S2, S2P, S4, S4P, S6, S6P, S8, S8P
Phases Used.....2, 2PED, 4, 4PED, 6, 6PED, 8, 8PED
Overlaps.....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
			113			104			119			110
			115			106			121			112

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	10-9	10-8	10-7	10-6	10-5	10-4	10-3	10-2	10-1	10-0	10-0	10-0	10-0	10-0
L	10-9	10-8	10-7	10-6	10-5	10-4	10-3	10-2	10-1	10-0	10-0	10-0	10-0	10-0

EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

SDLC NON-INTRUSIVE DETECTION CHART

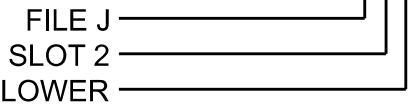
	DETECTOR RACK #3		DETECTOR RACK #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	5.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8	3.0		X		X	
8B	-	-	-	*	61	8	10.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB22-9,10	I12U	67	33	2	PED 2	NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.					
P41,P42	TB24-9,10	I12L	69	35	4	PED 4						
P61,P62	TB22-11,12	I13U	68	34	6	PED 6						
P81,P82	TB24-11,12	I13L	70	36	8	PED 8						

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:	US 421 Business (Main Street) at Fifth Street	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of:	Division 11 Wilkes County North Wilkesboro	SEAL
	PLAN DATE: May 2026 REVIEWED BY: J O Deaton	
	PREPARED BY: M W Yalch REVIEWED BY:	DocuSigned by: James O. Deaton 6/4/2026
	REVISIONS	INIT. DATE
750 N. Greenfield Pkwy, Garner, NC 27529		OFF BACKSHEET DATE
		SIG. INVENTORY NO. 11-0903

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0903
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

4-JUL-2026 21:53
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11-0903_110903_sm.dwg

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.2

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0903
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100



Electrical Detail - Sheet 2 of 2

Electrical and Programming
Details For:

Prepared for the Offices of:

US 421 Business (Main Street)
at
Fifth Street

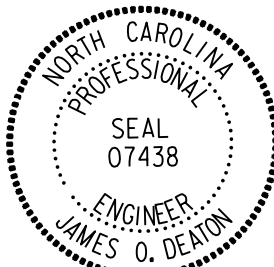
Division 11 Wilkes County North Wilkesboro

PLAN DATE: May 2026 REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

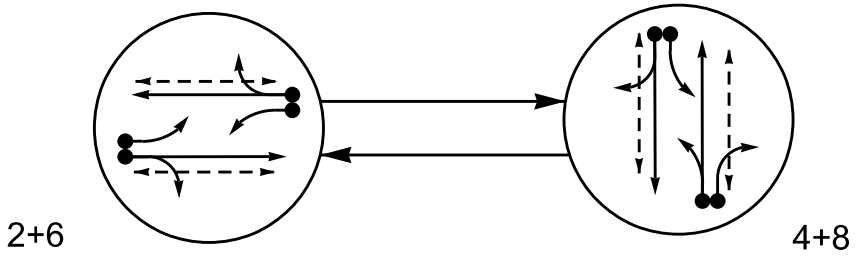
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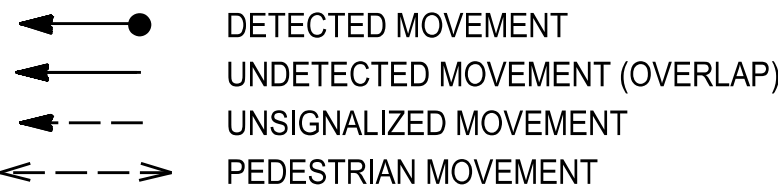
DocuSigned by:
James O. Deaton 6/4/2026
OFFICIAL BACKSTAMP DATE
SIG. INVENTORY NO. 11-0903

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig.1.0

PHASING DIAGRAM

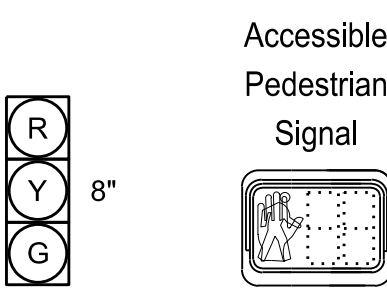


PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLA
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN	NEW CARD
2A	6X40	0	*	*	2	-	-	X	-	X	-
2B	6X40	0	*	*	2	-	-	X	-	X	-
4A	6X40	0	*	*	4	3.0	-	X	-	X	-
4B	6X40	0	*	*	4	15.0	-	X	-	X	-
6A	6X40	0	*	*	6	-	-	X	-	X	-
6B	6X40	0	*	*	6	-	-	X	-	X	-
8A	6X40	0	*	*	8	3.0	-	X	-	X	-
8B	6X40	0	*	*	8	10.0	-	X	-	X	-

* Multi-zone microwave detection.

2 Phase
Fully Actuated
D11-13-TBS_North Wilkesboro

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Install new 2070LX controller in existing cabinet.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See Roadway Design Plans for crosswalk and curb ramp locations.

MAXTIME TIMING CHART					
FEATURE	PHASE				
	2	4	6	8	
Walk *	7	7	7	7	
Ped Clear	11	14	13	11	
Min Green *	10	7	10	7	
Passage *	3.0	2.0	3.0	2.0	
Max 1 *	30	20	30	20	
Yellow Change	3.4	3.4	3.4	3.4	
Red Clear	3.2	2.6	3.2	2.6	
Added Initial *	-	-	-	-	
Maximum Initial *	-	-	-	-	
Time Before Reduction *	-	-	-	-	
Time To Reduce *	-	-	-	-	
Minimum Gap	-	-	-	-	
Advance Walk	7	6	7	6	
Non Lock Detector	-	X	-	X	
Vehicle Recall	MIN RECALL	-	MIN RECALL	-	
Dual Entry	-	X	-	X	
Simultaneous Start **	X	X	X	X	

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.
PB83	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Main Street.

LEGEND

PROPOSED	EXISTING
	N/A

Signal Upgrade

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		US 421 (Main Street) at 6th Street		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Division 11 Wilkes County N. Wilkesboro		Division 11 Wilkes County N. Wilkesboro		SEAL JUDITH CAROL LIND PROFESSIONAL ENGINEER SEAL 056268 ENGINEER YIUDONG HAN	
PLAN DATE: May 2026		REVIEWED BY: R. Garrett		SIGNED BY: Xudong Han 6/3/2026	
PREPARED BY: X. Han		REVIEWED BY:		DATE	
REVISIONS		INIT.		DATE	
0		1"=20'		DATE	
SIG. INVENTORY NO.		11-0904			

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that point in both directions of travel shall be installed if the median separates two parallel crosswalks.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

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HONG

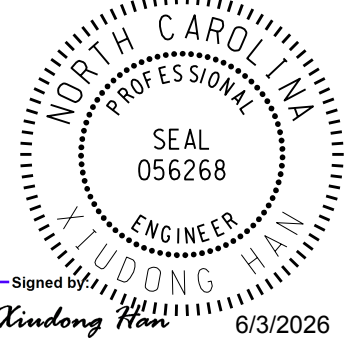
PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.2

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0904
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

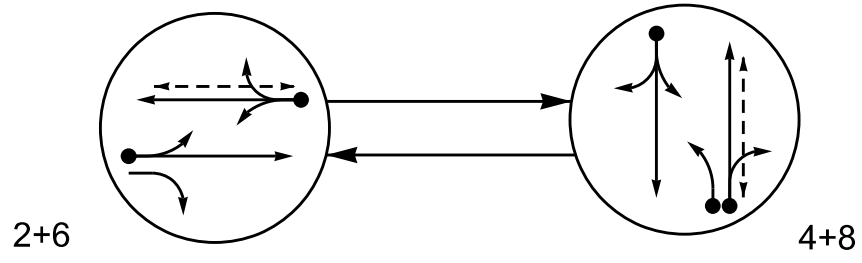
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:	US 421 (Main Street) At 6th Street	SEAL	
Prepared for the Offices of:	Division 11Wilkes CountyN. Wilkesboro	 SEAL 056268 XUDONG HAN ENGINEER STATE OF NORTH CAROLINA Signed by: <i>Xudong Han</i> 6/3/2026 DATE 51 RED055367MADE SIG. INVENTORY NO. 11-0904	
 750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: May 2026		REVIEWED BY: J. O. Deaton
	PREPARED BY: X. Han		REVIEWED BY:
	REVISIONS		INIT. DATE

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig.1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- ➡ DETECTED MOVEMENT
- ➡ UNDETECTED MOVEMENT (OVERLAP)
- ➡ UNSIGNALIZED MOVEMENT
- ➡ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLASH
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN	NEW CARD
2A	*	70	*	*	2	-	-	X	-	X	-
4A	*	0	*	*	4	3.0	-	X	-	X	-
6A	*	70	*	*	6	-	-	X	-	X	-
8A	*	0	*	*	8	-	-	X	-	X	-
8B	*	0	*	*	8	5.0	-	X	-	X	-

* Multi-zone microwave detection

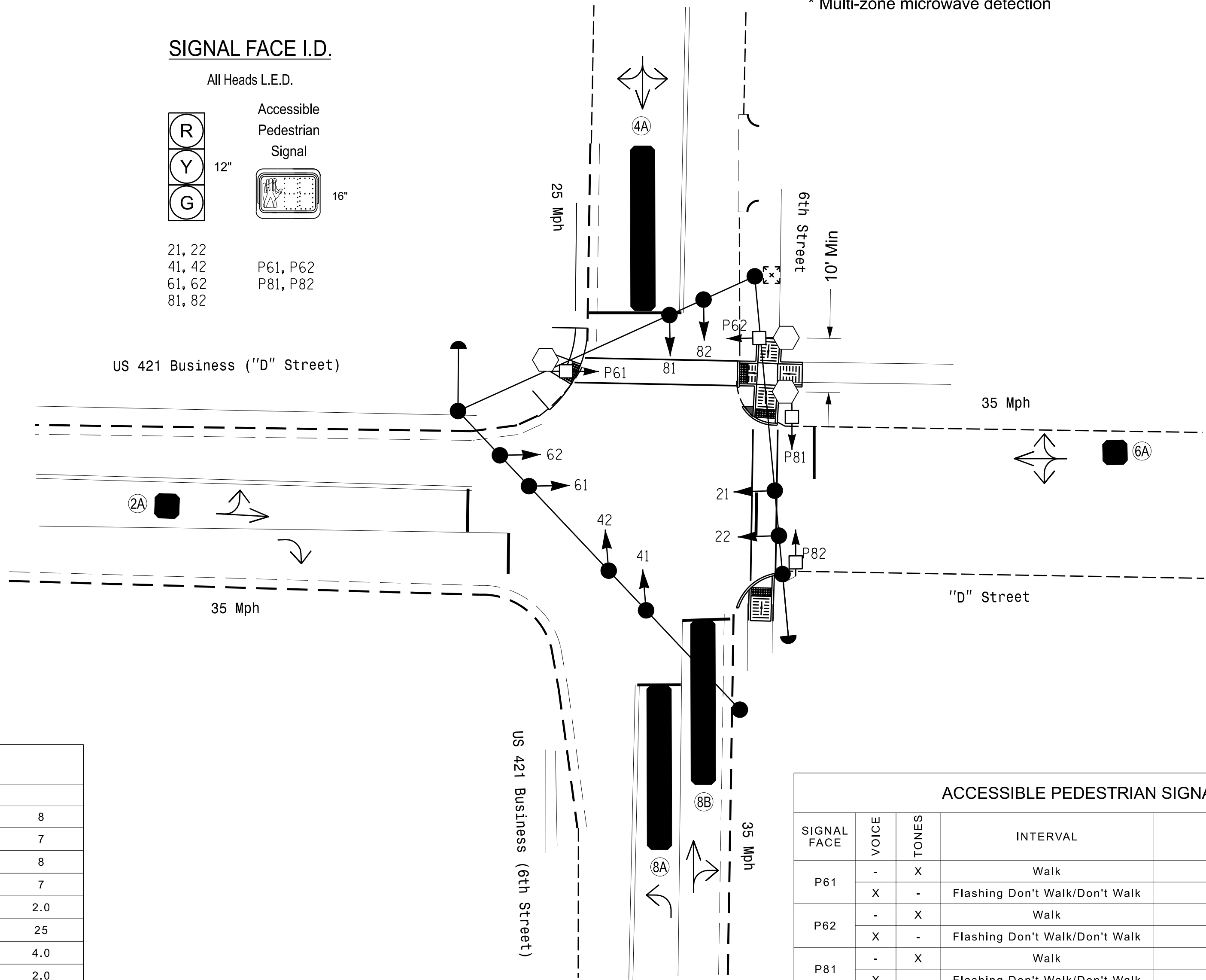
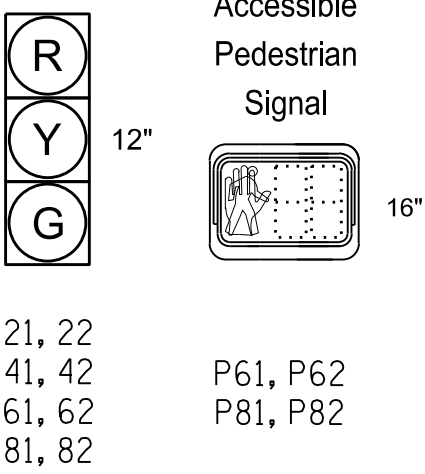
2 Phase
Fully Actuated
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Install new 2070LX controller in existing cabinet.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- See Roadway Design Plans for crosswalk and curbramp locations.

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Walk *	-	-	7	7
Ped Clear	-	-	8	8
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	25	25	25	25
Yellow Change	4.0	4.0	4.0	4.0
Red Clear	1.5	2.0	1.5	2.0
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	7	7
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Start **	X	X	X	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sixth Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.

LEGEND

PROPOSED	EXISTING

Signal Upgrade

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		US 421 Business (D Street) At US 421 Business (6th Street)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Division 11 Wilkes County N. Wilkesboro		PLAN DATE: June 2026 REVIEWED BY: R. Garrett		SEAL JUDITH CAROL LYN PROFESSIONAL ENGINEER SEAL 056268 6/3/2026	
PREPARED BY: X. Han		REVIEWED BY:		Signed by: 6/3/2026	
REVISIONS		INIT.		DATE	
0 SCALE 20 1"=20'					
				SIG. INVENTORY NO. 11-0914	

4-JUL-2026 21:58
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HONG

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

Electrical Detail - Sheet 2 of 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0914
DESIGNED: June 2026
SEALED: 06/03/2026
REVISED: N/A

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NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100



Electrical and Programming Details For:		US 421 Business (D Street) at US 421 Business (6th Street)	
Division 11		Wilkes County North Wilkesboro	
PLAN DATE:	May 2026	REVIEWED BY:	J O Deaton
PREPARED BY:	M W Yalch	REVIEWED BY:	
REVISIONS		INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SEAL	
DocuSigned by: James O. Deaton 6/4/2026	
OFF BACKSHEET DATE	
SIG. INVENTORY NO. 11-0914	

TABLE OF OPERATION				
SIGNAL FACE	PHASE			
	1 + 6	2 + 3	4	F A S H
21, 22	R	G	R	R
23	R	F	→	R
41, 42	R	R	←	R
43	R	R	F	R
61	←	G	→	R
62	G	G	R	R
P21, P22	DW	W	DW	DRK
P41, P42	DW	DW	W	DRK

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

All Heads L.E.D.

$\left(\frac{FY}{G} \right) \rightarrow$ = Bimodal Section

Signal	Height	Width	Color	Material	Mounting	Notes
	12"	12"	Red, Yellow, Green	Plastic	Standard	41, 42
	12"	12"	Red, Yellow, Green	Plastic	Standard	61
	12"	12"	Red, Yellow, Green	Plastic	Standard	21, 22 62
	12"	12"	Red, Yellow, Green	Plastic	Standard	43
	12"	12"	Red, Yellow, Green	Plastic	Standard	23
	16"	16"	Red, Green	Plastic	Standard	P21, P22 P41, P42

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X40	0	*	X	2	-	-	X	-	X	-	X
4A	6X40	0	*	X	4	3.0	-	X	-	X	-	X
4B	6X40	0	*	X	4	-	-	X	-	X	-	X
4C	6X40	0	*	X	4	10.0	-	X	-	X	-	X
6A	6X40	0	*	X	6	-	-	X	-	X	-	X
6B	6X40	0	*	X	6	-	-	X	-	X	-	X

*Multi-zone microwave detection

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross CBD Loop.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross CBD Loop.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
8. Remove Existing Right Arrow "ONLY" Sign (R3-5R).
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supercede these values.
11. To provide a Leading Pedestrian Interval on phase 4, program FYA head numbered 43 to delay for 7 seconds after the start of the phase 4 walk interval. See Electrical Details for programming.
12. See Roadway Design Plans for crosswalk and curb ramp locations.

FEATURE	PHASE			
	1	2	4	6
Walk *	-	7	7	-
Ped Clear	-	19	12	-
Min Green *	7	7	7	7
Passage *	2.0	2.0	2.0	2.0
Max 1 *	8	20	17	20
Yellow Change	3.0	4.0	4.0	4.0
Red Clear	2.4	2.4	2.4	2.4
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	7	7 #	-
Non Lock Detector	X	-	X	-
Vehicle Recall	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-
Simultaneous Start **	X	X	X	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
 ** Program phases 2&6 for Simultaneous Start for LPI.
 # See Note 11.

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
	Non-Intrusive Detection Zone	
	Type II Signal Pedestal	

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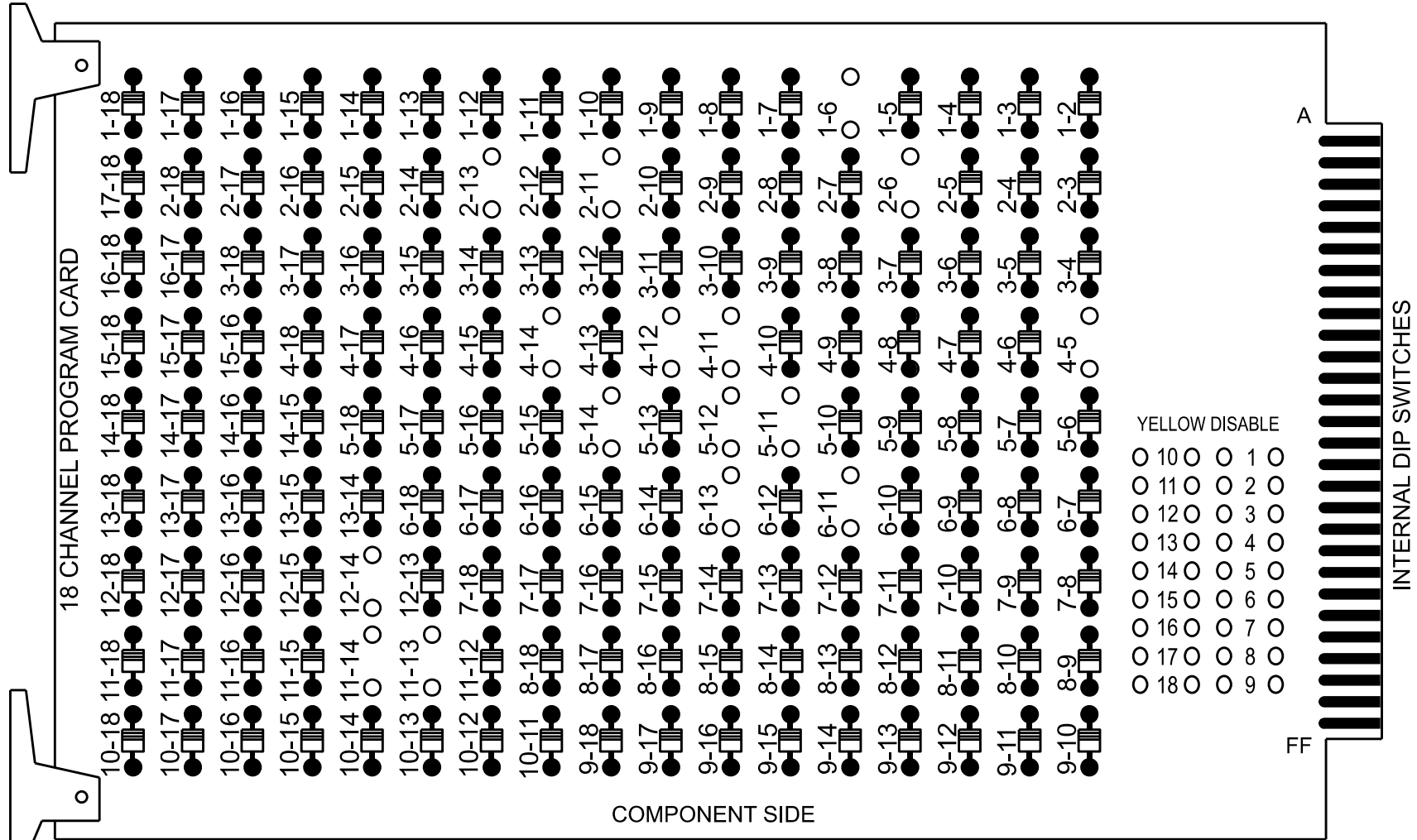
AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

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HONG

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

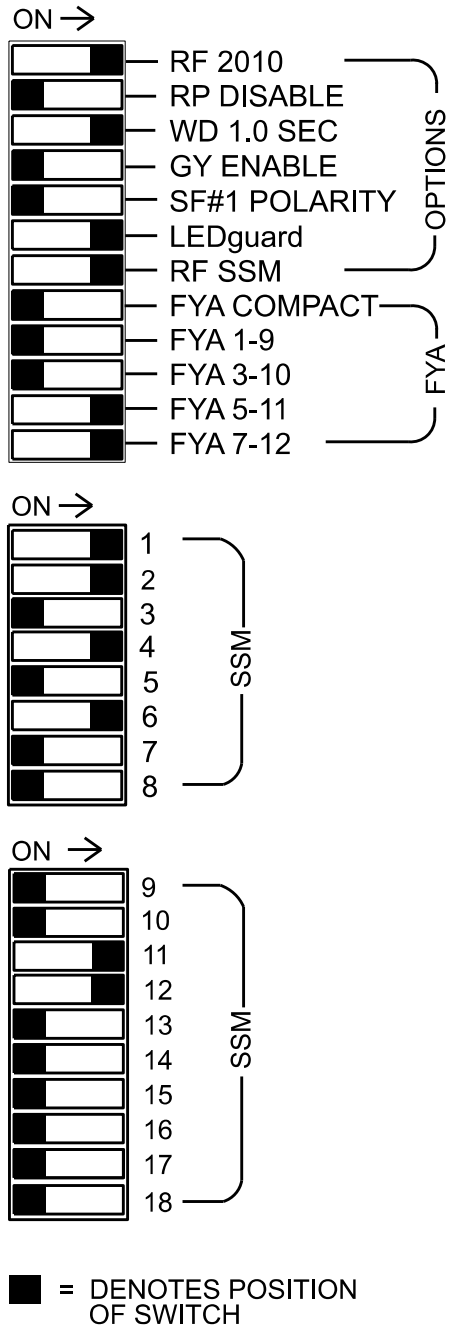
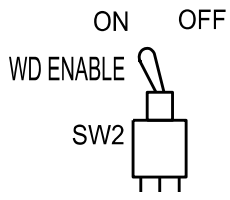
REMOVE DIODE JUMPERS 1-6, 2-6, 2-11, 2-13, 4-5, 4-11, 4-12, 4-14, 5-11, 5-12, 5-14, 6-11, 6-13, 11-13, 11-14, AND 12-14.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- Program phases 2, 4, 6 and 8 for Simultaneous Start.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-13-TBS North Wilkesboro Time Based System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S3, S5, S6, S7, S8, AUX S4, AUX S5
Phases Used.....1, 2, 2PED, 4, 4PED, 6
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "7".....*

*See overlap programming detail on sheet 2.

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	61	21,22	P21, P22	NU	41,42	P41, P42	23	61,62	NU	NU	NU	NU	NU	NU	NU	23	43	NU
RED	*	128						134									A101	
YELLOW		129					*	135										
GREEN		130						136										
RED ARROW					101											A114		
YELLOW ARROW	126				102											A115	A102	
FLASHING YELLOW ARROW																A116	A103	
GREEN ARROW	127				103		133											
Hand icon			113			104												
Walking person icon			115			106												

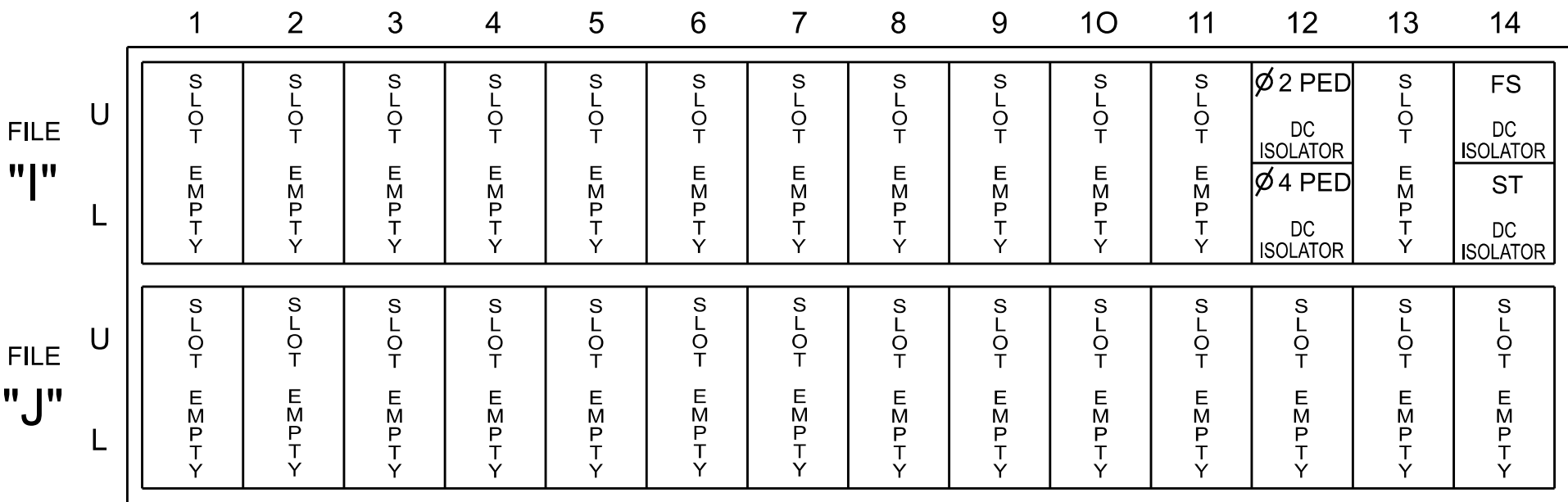
NU = Not Used

* Denotes install load resistor. See load resistor installation detail on sheet 2.

* See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



EX : 1A, 2A, ETC. = LOOP NO.'S

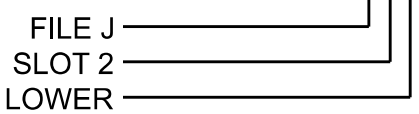
FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
4B	-	-	-	*	45	4			X		X	
4C	-	-	-	*	46	4	10.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2	NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.					
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L



SDLC NON-INTRUSIVE DETECTION CHART

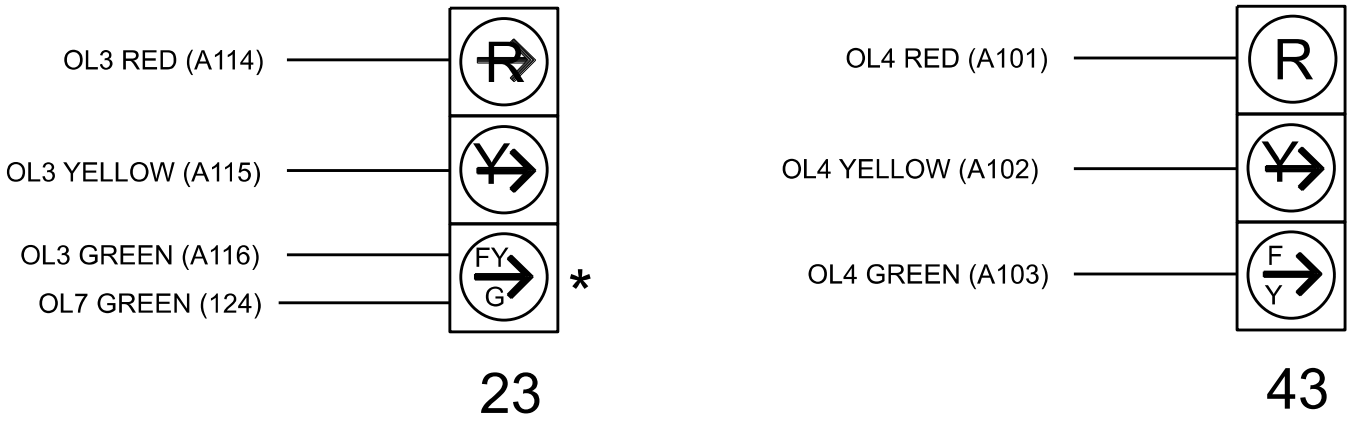
	DETECTOR RACK #3		DETECTOR RACK #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	NU
13	45	4B	61	NU
14	46	4C	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



* Bimodal Section

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0073
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:	US 421 Business (D Street) at NC 18-268 (CBD Loop)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of:	Division 11 Wilkes County North Wilkesboro	SEAL
PLAN DATE: May 2026	REVIEWED BY: J O Deaton	SEAL 07438
PREPARED BY: M W Yalch	REVIEWED BY:	ENGINEER JAMES O. DEATON
REVISIONS	INIT.	DATE
750 N. Greenfield Pkwy, Garner, NC 27529		
DocuSigned by: James O. Deaton	6/4/2026	
OFF BACKSHEET	DATE	
SIG. INVENTORY NO.	11-0073	

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Front Panel
Main Menu >Controller >Unit

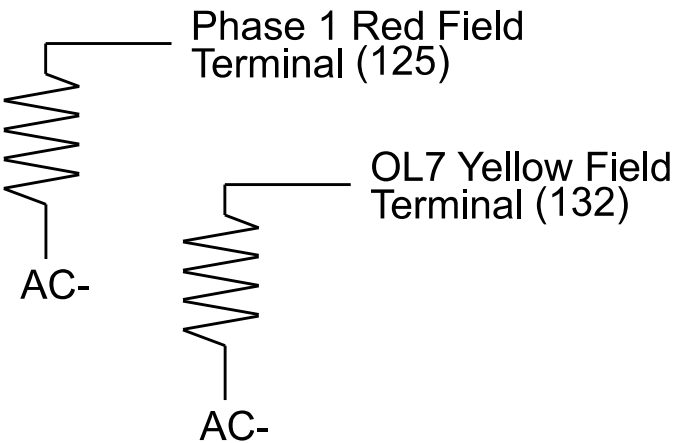
Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0073
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A



Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4	7
Type	Off	Off	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	2	4	4
Modifier Phases	-	-	4	-	-
Modifier Overlaps	-	-	-	-	-
Trail Green	0	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0	0.0
FYA Ped Delay	0.0	0.0	0.0	7.0	0.0

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Overlap	7		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE OVERLAP
CONTROL SOURCE 7
ASSIGNED TO CHANNEL 5 →

Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:	US 421 Business (D Street) at NC 18-268 (CBD Loop)	SEAL 																														
Prepared for the Offices of:  Transportation Mobility and Safety Division DIVISION OF TRANSPORTATION STATE OF NORTH CAROLINA Signals Management Section	Division 11 Wilkes County North Wilkesboro																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">PLAN DATE: May 2026</td> <td style="width: 50%;">REVIEWED BY: J O Deaton</td> </tr> <tr> <td>PREPARED BY: M W Yalch</td> <td>REVIEWED BY:</td> </tr> </table>			PLAN DATE: May 2026	REVIEWED BY: J O Deaton	PREPARED BY: M W Yalch	REVIEWED BY:																										
PLAN DATE: May 2026	REVIEWED BY: J O Deaton																															
PREPARED BY: M W Yalch	REVIEWED BY:																															
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REVISIONS	INT.	DATE																														
DocuSigned by:  6/4/2026 NOT FOR CONSTRUCTION DATE																																
750 N. Greenfield Pkwy, Garner, NC 27529 SIG. INVENTORY NO. 11-0073																																

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

	8"	
21,22		P21,P22
41,42		P41,P42
61,62		P61,P62
81,82		P81,P82

TABLE OF OPERATION			
SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLASH
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM SLP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN	NEW CARD
2A	6X6	70	*	*	2	-	-	X	-	X	-
2B	6X40	0	*	*	2	-	-	X	-	X	-
4A	6X40	0	*	*	4	5.0	-	X	-	X	-
6A	6X6	70	*	*	6	-	-	X	-	X	-
6B	6X6	70	*	*	6	-	-	X	-	X	-
8A	6X40	0	*	*	8	5.0	-	X	-	X	-

Site plan for the intersection of SR 2367 (10th Street) and US 421 Business (D Street). The plan shows the layout of the intersection, including the signalized crosswalks, the 10th Street bridge, and the 421 Business bridge. It includes various callouts for signal heads (P21, P22, P41, P42, P61, P62, P81, P82), detectors (A, B, C), and other features like parking areas and 10-foot minimum clearances. The plan also shows the 25 MPH 0% grade and the 20 MPH 0% grade. A legend at the bottom right defines the signal face, voice, tones, and intersection type for each signal head. A table at the top right shows the dimensions of the signal heads (8A, 6B, 6A) and the dimensions of the intersection (8A, 6X40, 0).

Signal Head	Dimensions	Grade	Notes
8A	6X6	70	*
6B	6X6	70	*
6A	6X40	0	*

* Multi-zone microwave detector

Signal Head	Signal Face	Voice	Tones	Intersection Type
P21	-	X	-	Wa
P21	X	-	-	Flashing Don't V
P22	-	X	-	Wa
P22	X	-	-	Flashing Don't V
P41	-	X	-	Wa
P41	X	-	-	Flashing Don't V

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Tenth Street.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Tenth Street.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Tenth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Tenth Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	4-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Combined Through and Right Arrow Sign (R3-6R)	
	Left Arrow "ONLY" Sign (R3-5L)	
	Combined Through and Left Arrow Sign (R3-6L)	
	Type II Signal Pedestal	
N/A	Curb Ramp	
	Non-Intrusive Detection Zone	

FEATURE	PHASE			
	2	4	6	8
Walk *	7	7	7	7
Ped Clear	10	10	10	9
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	34	16	34	16
Yellow Change	4.0	4.0	4.0	4.0
Red Clear	2.1	3.0	2.1	3.0
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	7	5	7	4
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Start **	X	X	X	X

**** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.**

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Phone: 919-461-1100

Division 11 Wilkes County Wilkesboro

PLAN DATE:	June 2026	REVIEWED BY:	R. Garrett
------------	-----------	--------------	------------

PREPARED BY:	X. Han	REVIEWED BY:
--------------	--------	--------------

REVISIONS	INIT.	DATE

[illegible]

UDONG HALL

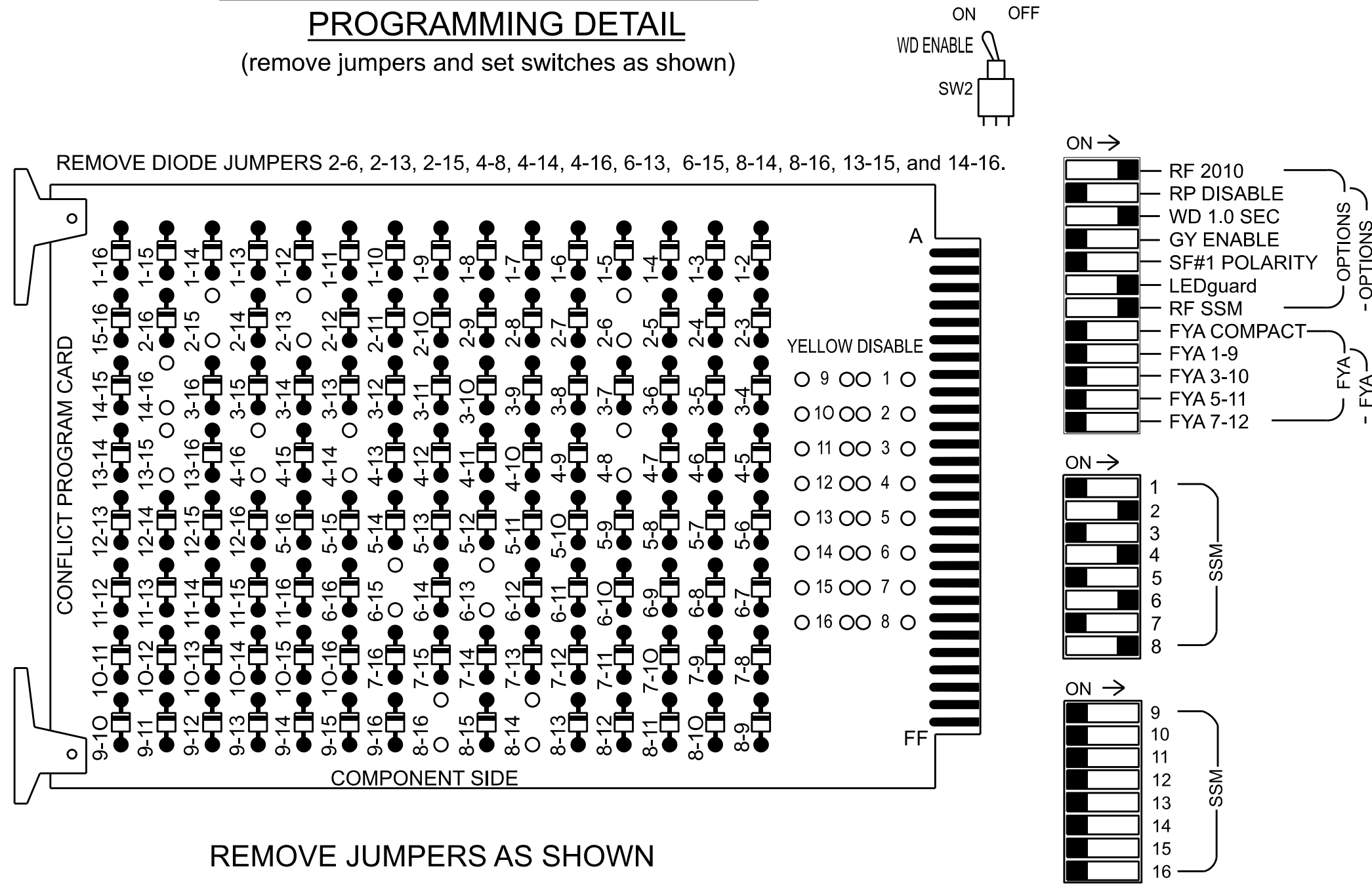
Signed by: _____

Xindong Han 6/3/2026

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16 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

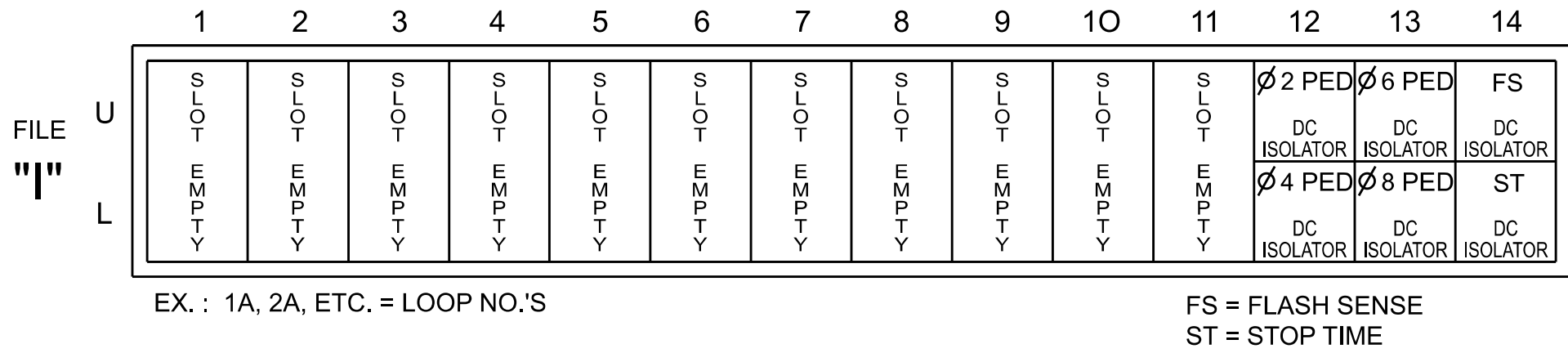
(remove jumpers and set switches as shown)



- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Make sure jumpers SEL2-SEL5 are present on the monitor board.

INPUT FILE POSITION LAYOUT

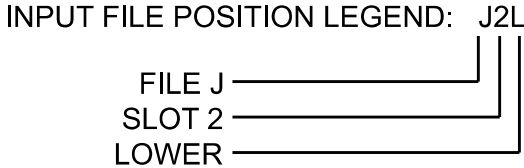
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	5.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
8A	-	-	-	*	60	8	5.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor Inputs 1, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15 and 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Program phases 2, 4, 6 and 8 for Simultaneous Start.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-13-TBS_North Wilkesboro System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....336
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....12
Load Switches Used.....S2, S2P, S4, S4P, S6, S6P, S8, S8P
Phases Used.....2, 2PED, 4, 4PED, 6, 6PED, 8, 8PED
OverlapsNOT USED

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

SDLC NON-INTRUSIVE DETECTION CHART

Input Point	DETECTOR RACK #3		DETECTOR RACK #4	
	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
FLASHING YELLOW ARROW												
GREEN ARROW												
			113			104			119			110
			115			106			121			112

NU = Not Used

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 421 Business (D Street)
At
SR 2367 (10th Street)

Division 11Wilkes CountyWilkesboro

PLAN DATE: May 2026REVIEWED BY: M. W. Yalch

PREPARED BY: X. HanREVIEWED BY: J. O. Deaton

REVISIONS

INIT. DATE

Signed by: 6/3/2026

SIG. INVENTORY NO. 11-0910

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that point in both directions of travel shall be installed if the median separates two parallel crosswalks.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

T:\JULY-2026_21146
DWG\AECOM\nc-pw-bentley.com\AECOM\USA_NorTh_Carol\nc\Documents\60782169-2026 TAP Signal Upgrades\900-CAD 615\910_CAD\A_Signal s\01\vis\on 11\11-0910\110910.sm.dwg
11-0910

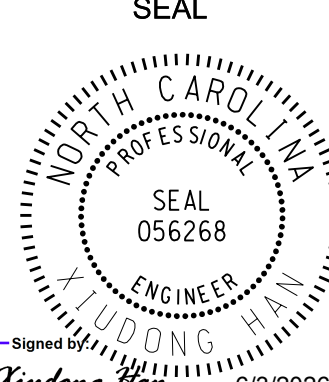
PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.2

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0910
DESIGNED: May 2026
SEALED: 06/03/2026
REVISED: N/A

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NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:	US 421 Business (D Street) At SR 2367 (10th Street)	SEAL
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Division 11 Wilkes County Wilkesboro PLAN DATE: May 2026 REVIEWED BY: M. W. Yalch PREPARED BY: X. Han REVIEWED BY: REVISIONS INIT. DATE SIGNED BY: <i>Xudong Han</i> 6/3/2026 DATE SIG. INVENTORY NO. 11-0910	

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	F + S H
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

Diagram illustrating a vertical stack of three circles (R, Y, G) with a dimension line indicating a total height of 8".

21,22
41,42
61,62
81,82



16"

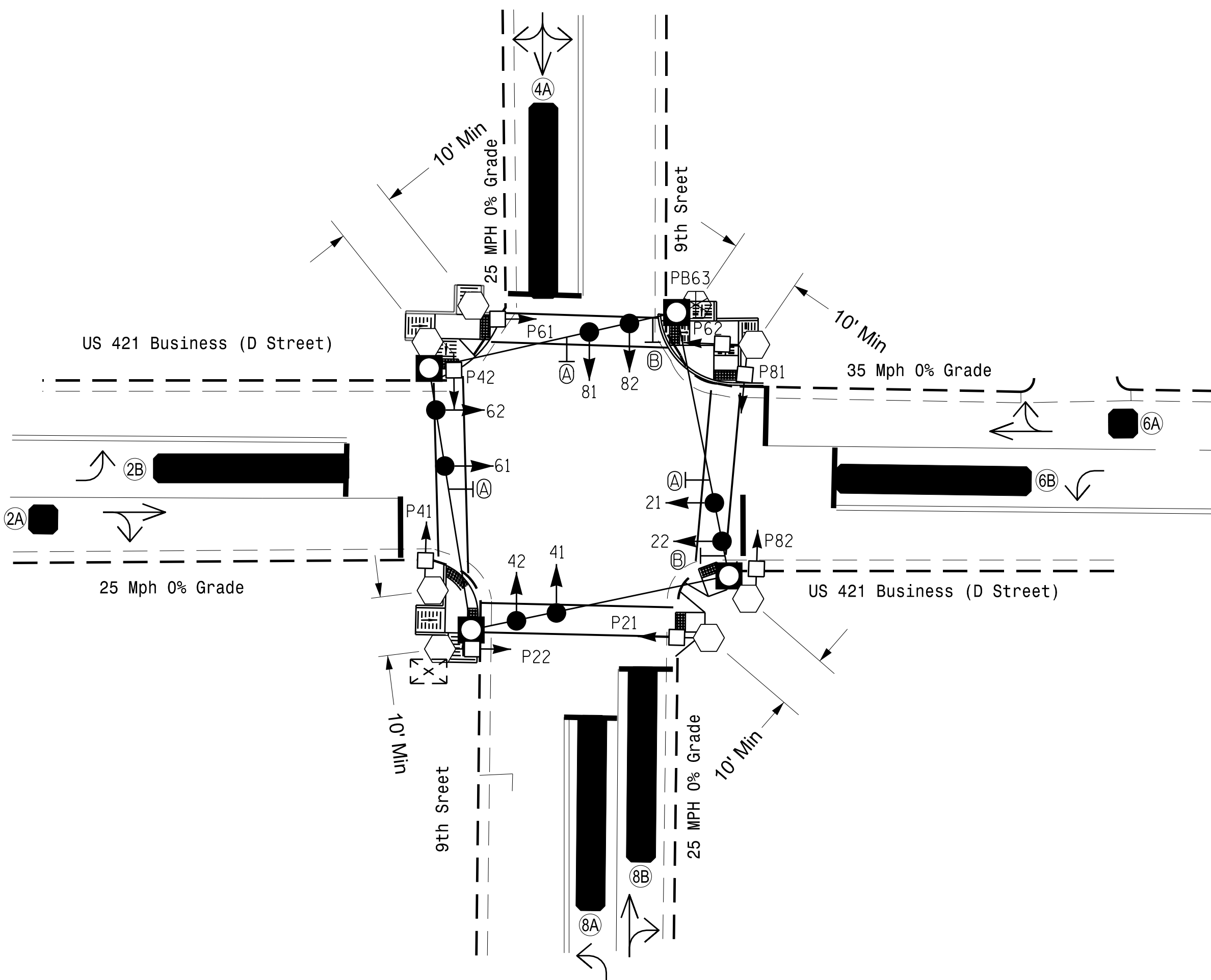
P21,P22
P41,P42
P61,P62
P81,P82

DETECTOR					PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURN\$	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN	NEW CARD		
2A	6X6	70	*	*	2	-	-	X	-	X	-	*	
2B	6X40	0	*	*	2	-	-	X	-	X	-	*	
4A	6X40	0	*	*	4	5.0	-	X	-	X	-	*	
6A	6X6	70	*	*	6	-	-	X	-	X	-	*	
6B	6X40	0	*	*	6	-	-	X	-	X	-	*	
8A	6X40	0	*	*	8	3.0	-	X	-	X	-	*	
8B	6X40	0	*	*	8	5.0	-	X	-	X	-	*	

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Ninth Street.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Ninth Street.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Ninth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Ninth Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.

FEATURE	PHASE			
	2	4	6	8
Walk *	7	7	7	7
Ped Clear	9	9	7	8
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	37	13	37	13
Yellow Change	4.0	4.0	4.0	4.0
Red Clear	1.9	2.1	1.9	2.1
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	6	5	6	4
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Start **	X	X	X	X

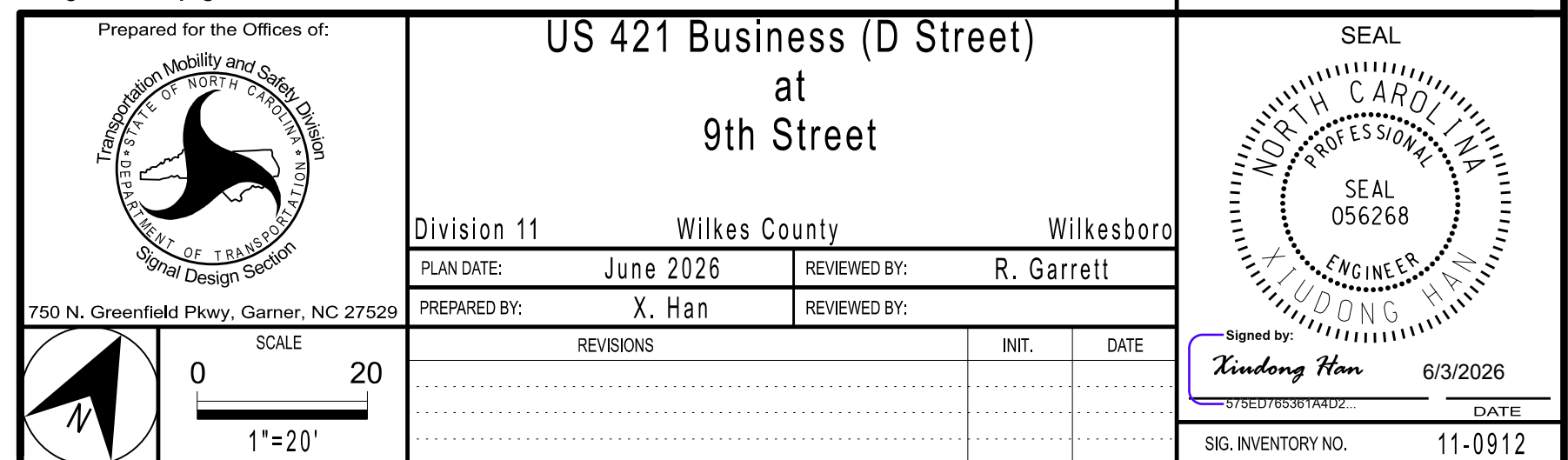
** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.



2 Phase
Fully Actuated
D11-13-TBS_North Wilkesboro

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Install new 2070LX controller in existing cabinet.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. See Roadway Design Plans for crosswalk and curb ramp locations.

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OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that point in both directions of travel shall be installed if the median separates two parallel crosswalks.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

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HONG

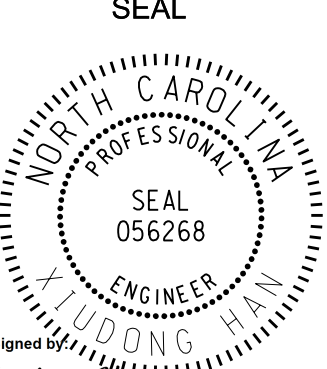
PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.2

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0912
DESIGNED: June 2026
SEALED: 06/03/2026
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 2 of 2

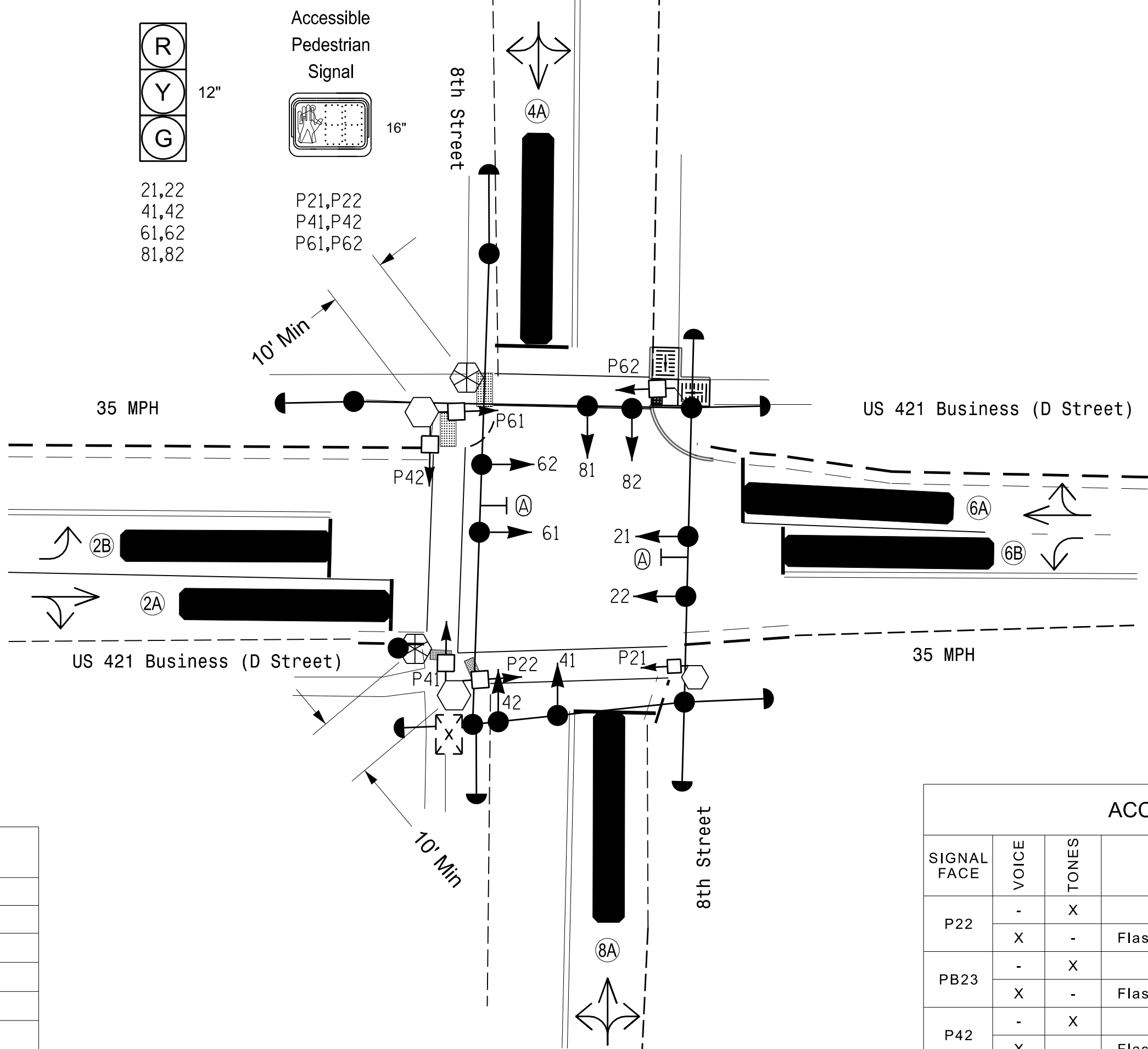
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 421 Business (D Street) At 9th Street		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 056268 XUDONG HAN Signed by: <i>Xudong Han</i> 6/3/2026 DATE SIG. INVENTORY NO. 11-0912
	Division 11Wilkes CountyWilkesboro		
	PLAN DATE: May 2026	REVIEWED BY: J. O. Deaton	
	PREPARED BY: X. Han	REVIEWED BY:	
	REVISIONS	INIT. DATE	

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.

* Multi-zone microwave detection

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Eighth Street.
PB23	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Eighth Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
PB43	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross D Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Eighth Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Eighth Street.

 --- X-UC ---
 N/A

 N/A

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NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

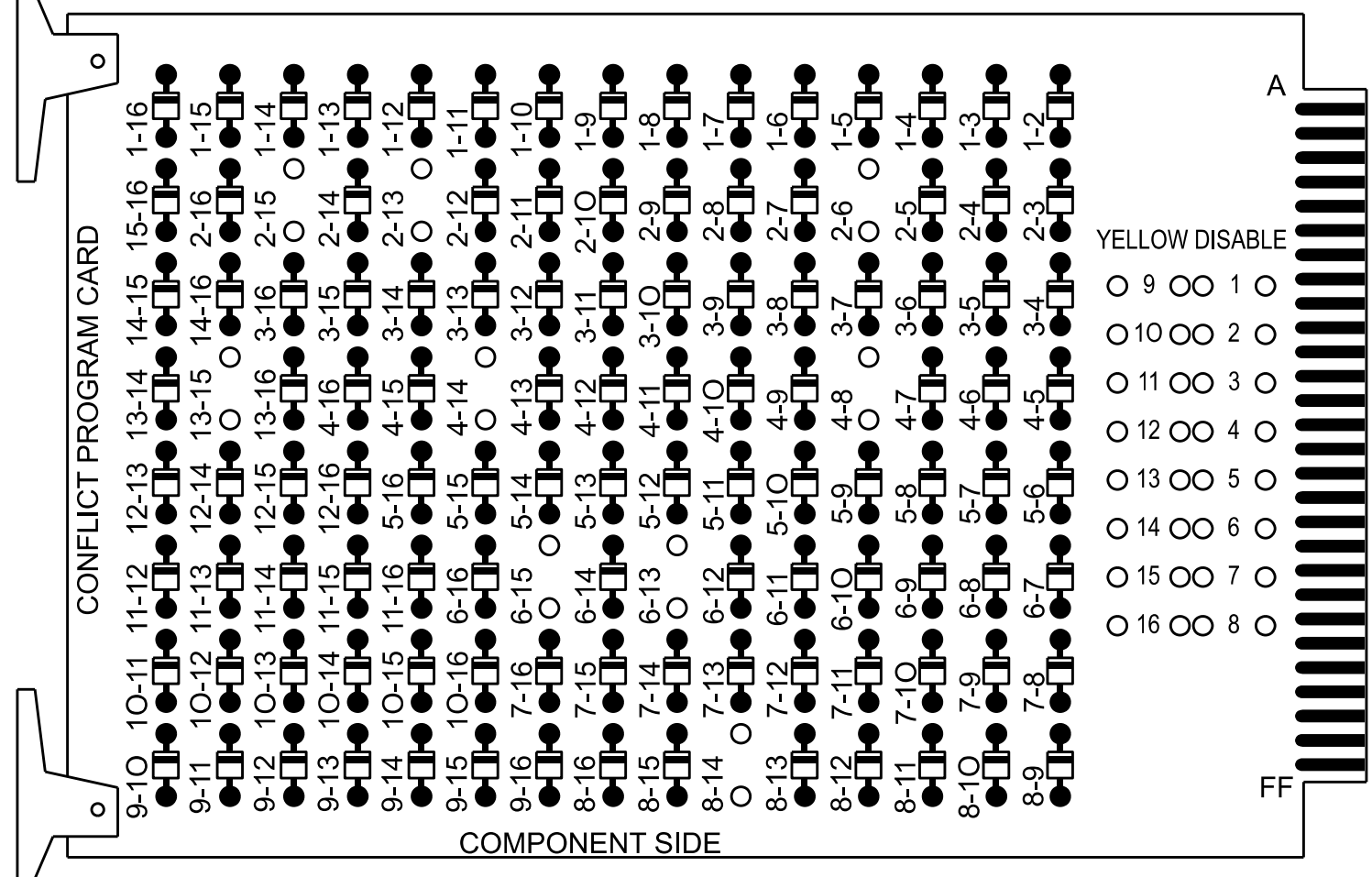
Prepared for the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA SIGNAL DESIGN SECTION	US 421 Business (D Street) at 8th Street	SEAL SEAL 056268 XINDONG HAN ENGINEER																																	
750 N. Greenfield Pkwy, Garner, NC 27529																																			
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PLAN DATE: June 2026	REVIEWED BY: R. Garrett																																		
PREPARED BY: X. Han	REVIEWED BY:																																		
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Signed by: 	6/3/2026																																		
317627/0330/TRAUSE	DATE:																																		
SIG. INVENTORY NO.	11-0913																																		

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HONG

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-8, 4-14, 6-13, 6-15, 8-14 AND 13-15.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1, 3, 5, 7, 9, 10, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Program phases 2, 4, 6 and 8 for Simultaneous Start.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-13-TBS North Wilkesboro Time Based System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....336
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....12
Load Switches Used.....S2, S2P, S4, S4P, S6, S6P, S8
Phases Used.....2, 2PED, 4, 4PED, 6, 6PED, 8
Overlaps.....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.1

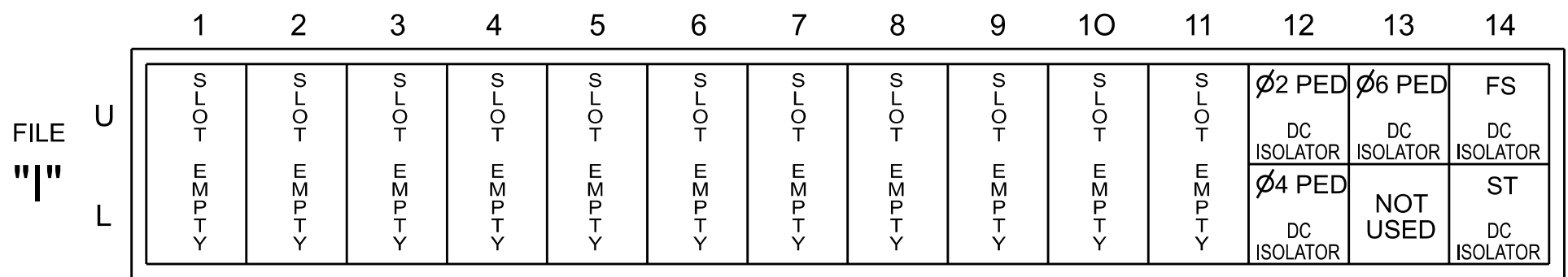
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
Hand icon			113			104			119			
Walking person icon			115			106			121			

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

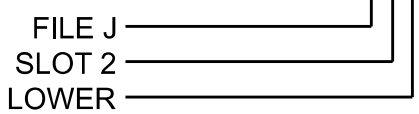
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2	3.0		X		X	
4A	-	-	-	*	44	4	10.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6	3.0		X		X	
8A	-	-	-	*	60	8	10.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB22-9,10	I12U	67	33	2	PED 2						
P41,P42	TB24-9,10	I12L	69	35	4	PED 4						
P61,P62	TB22-11,12	I13U	68	34	6	PED 6						

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
I12 AND I13.

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

SDLC NON-INTRUSIVE DETECTION CHART

	DETECTOR RACK #3		DETECTOR RACK #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0913
DESIGNED: June 2026
SEALED: 06/03/2026
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:		US 421 Business (D Street) at 8th Street		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		Division 11 Wilkes County North Wilkesboro		SEAL	
PLAN DATE: May 2026		REVIEWED BY: J O Deaton		SEAL 07438	
PREPARED BY: M W Yalch		REVIEWED BY:		ENGINEER JAMES O. DEATON	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529				6/4/2026	
				DATE	
				SIG. INVENTORY NO. 11-0913	

The Enhanced Out of Pavement Detection requires adjustments to the O Modules in use. Follow the programming instructions below to ensure desired operation.

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

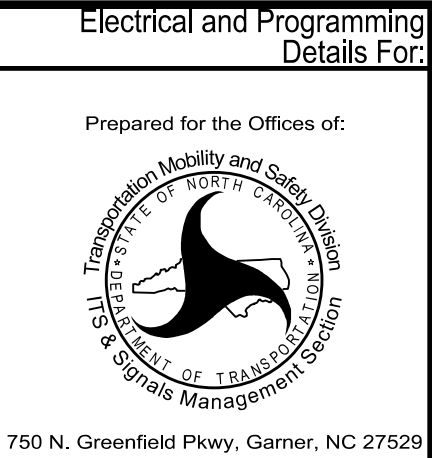
Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment.
Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

All Red Flash Exit Time
6

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Suite 200, Raleigh, NC 27607
Phone: 919-461-1100



US 421 Business (D Street)
at
8th Street

Division 11 Wilkes County North Wilkesboro

PLAN DATE: May 2026	REVIEWED BY: J O Deaton
---------------------	-------------------------

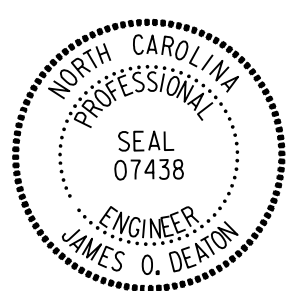
PREPARED BY: M W Yalch	REVIEWED BY:		
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REVISIONS	INIT.	DATE

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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

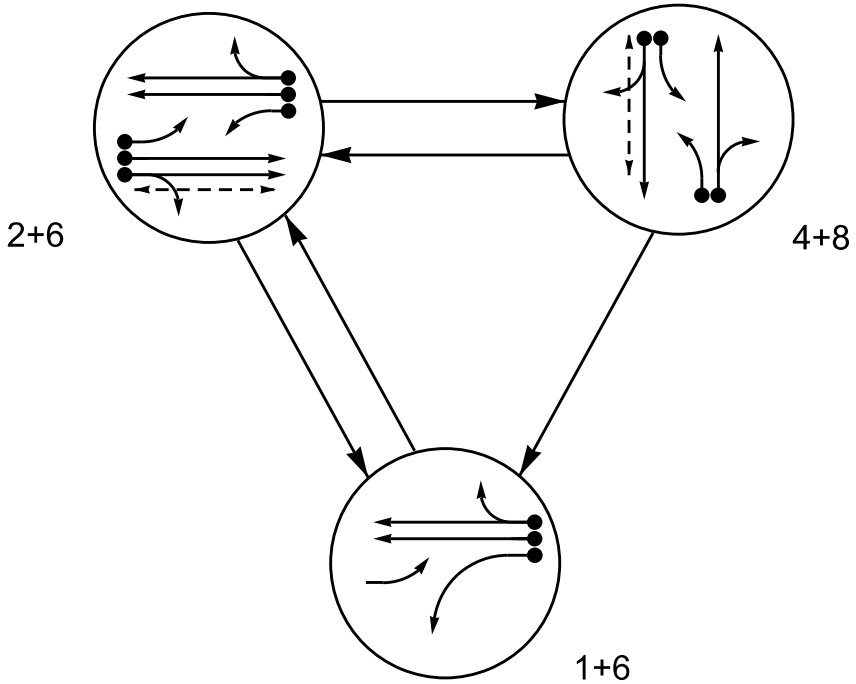


DocuSigned by:
James O. Deaton 6/4/2026

40FF8AC430BD40F...	DATE
SIG. INVENTORY NO.	11-0913

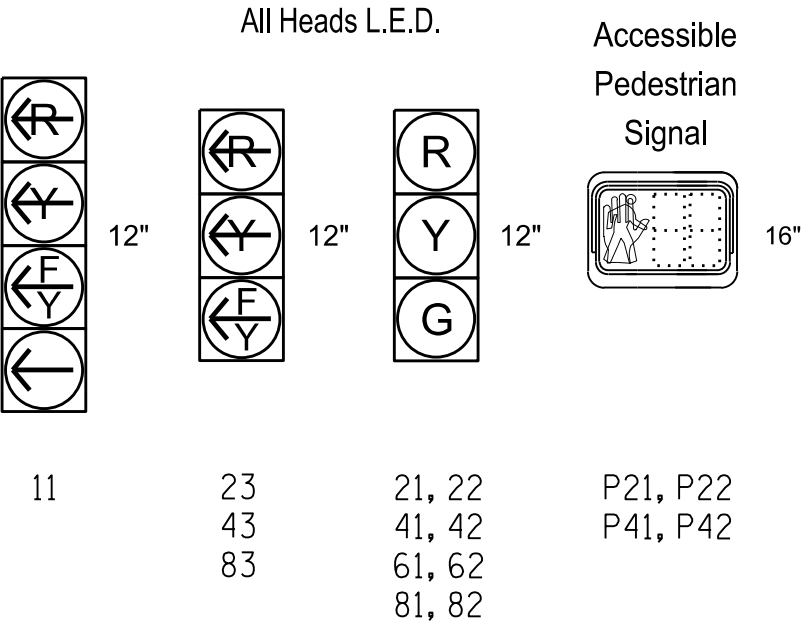
PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig.1.0

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	1 + 6	2 + 6	4 + 8	F + 6 + 8
11	←	↙	↘	↘
21, 22	R	G	R	R
23	↙	↙	↘	↘
41, 42	R	R	G	R
43	↘	↘	↙	↙
61, 62	G	G	R	R
81, 82	R	R	G	R
83	↘	↘	↙	↘
P21, P22	DW	W	DW	DRK
P41, P42	DW	DW	W	DRK

SIGNAL FACE I.D.



MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN
1A	6X40	0	*	*	1	15.0	-	X	-	X
2A	6X6	70	*	*	2	-	-	X	-	X
2B	6X6	70	*	*	2	-	-	X	-	X
2C	6X40	0	*	*	2	-	-	X	-	X
4A	6X15	+5	*	*	4	3.0	-	X	-	X
4B	6X15	+5	*	*	4	10.0	-	X	-	X
6A	6X6	70	*	*	6	-	-	X	-	X
6B	6X6	70	*	*	6	-	-	X	-	X
8A	6X40	0	*	*	8	3.0	-	X	-	X
8B	6X40	0	*	*	8	10.0	-	X	-	X

*Multi-zone microwave detection

3 Phase
Fully Actuated
D11-05_North Wilkesboro

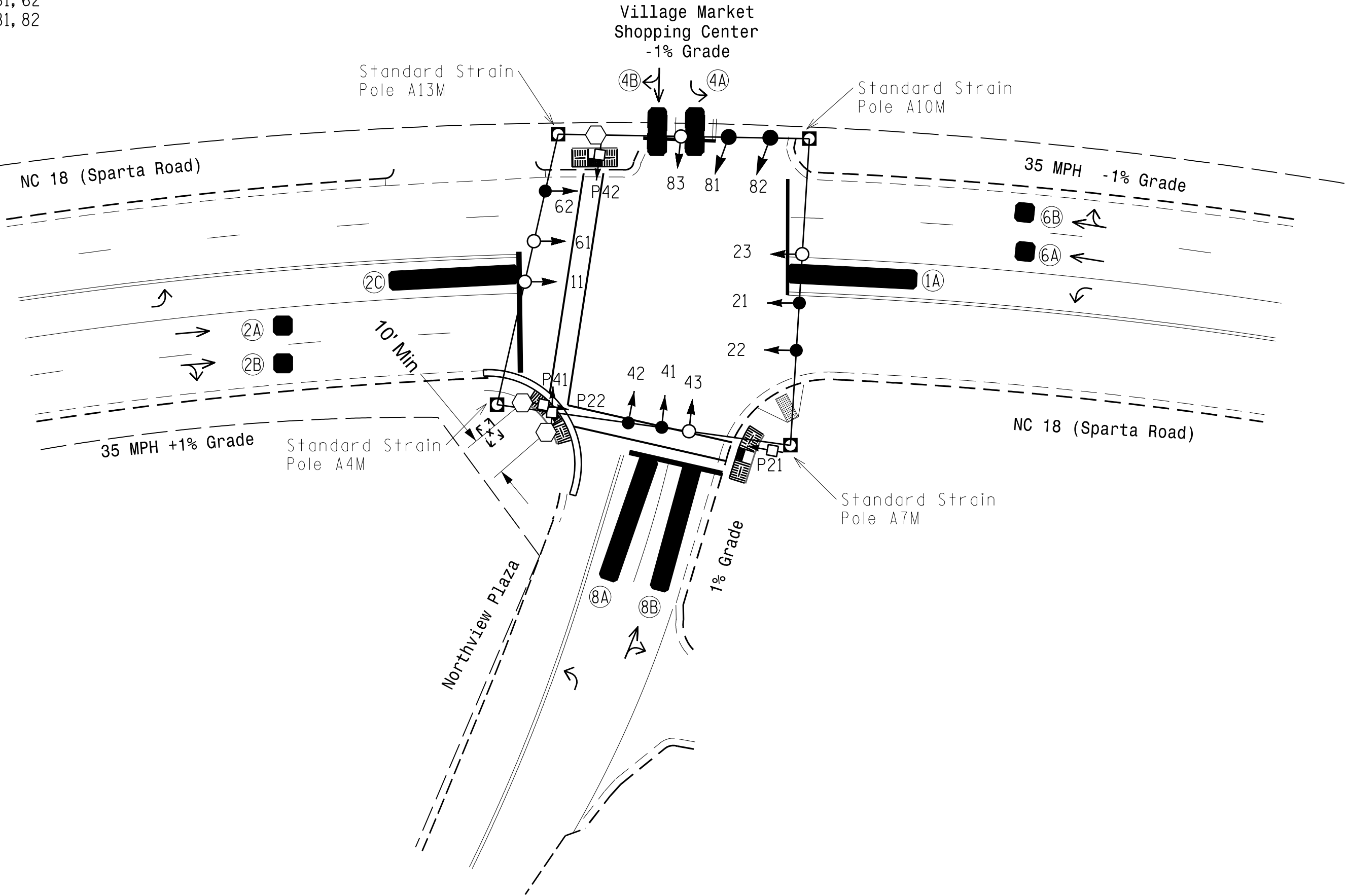
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal heads numbered 21, 22 and 62.
- Set all detector units to presence mode.
- Install new 2070LX controller in existing cabinet.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See Roadway Design Plans for crosswalk and curb ramp locations.
- Disconnect and abandon existing system loops S1 and S2.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sparta Road.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sparta Road.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Northview Plaza.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Northview Plaza.

MAXTIME TIMING CHART					
FEATURE	PHASE				
	1	2	4	6	8
Walk *	-	7	7	-	-
Ped Clear	-	13	19	-	-
Min Green *	7	10	7	10	7
Passage *	2.0	2.0	2.0	2.0	2.0
Max 1 *	20	50	25	50	25
Yellow Change	3.0	3.9	3.2	3.9	3.2
Red Clear	2.4	1.6	2.5	1.6	2.5
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Advance Walk	-	7	7	-	-
Non Lock Detector	X	-	X	-	X
Vehicle Recall	-	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	-	X	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



LEGEND

PROPOSED	EXISTING

Signal Upgrade

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		NC 18 (Sparta Road) at Northview Plaza Village Market Shopping Center Division 11 Wilkes County N Wilkesboro		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PLAN DATE: June 2026		REVIEWED BY: R. Garrett		SEAL JUDITH CAROL HAN PROFESSIONAL ENGINEER SEAL 056268	
PREPARED BY: X. Han		REVIEWED BY:		Signed by: 6/5/2026	
REVISIONS		INIT.		DATE	
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SIG. INVENTORY NO.		11-0090			

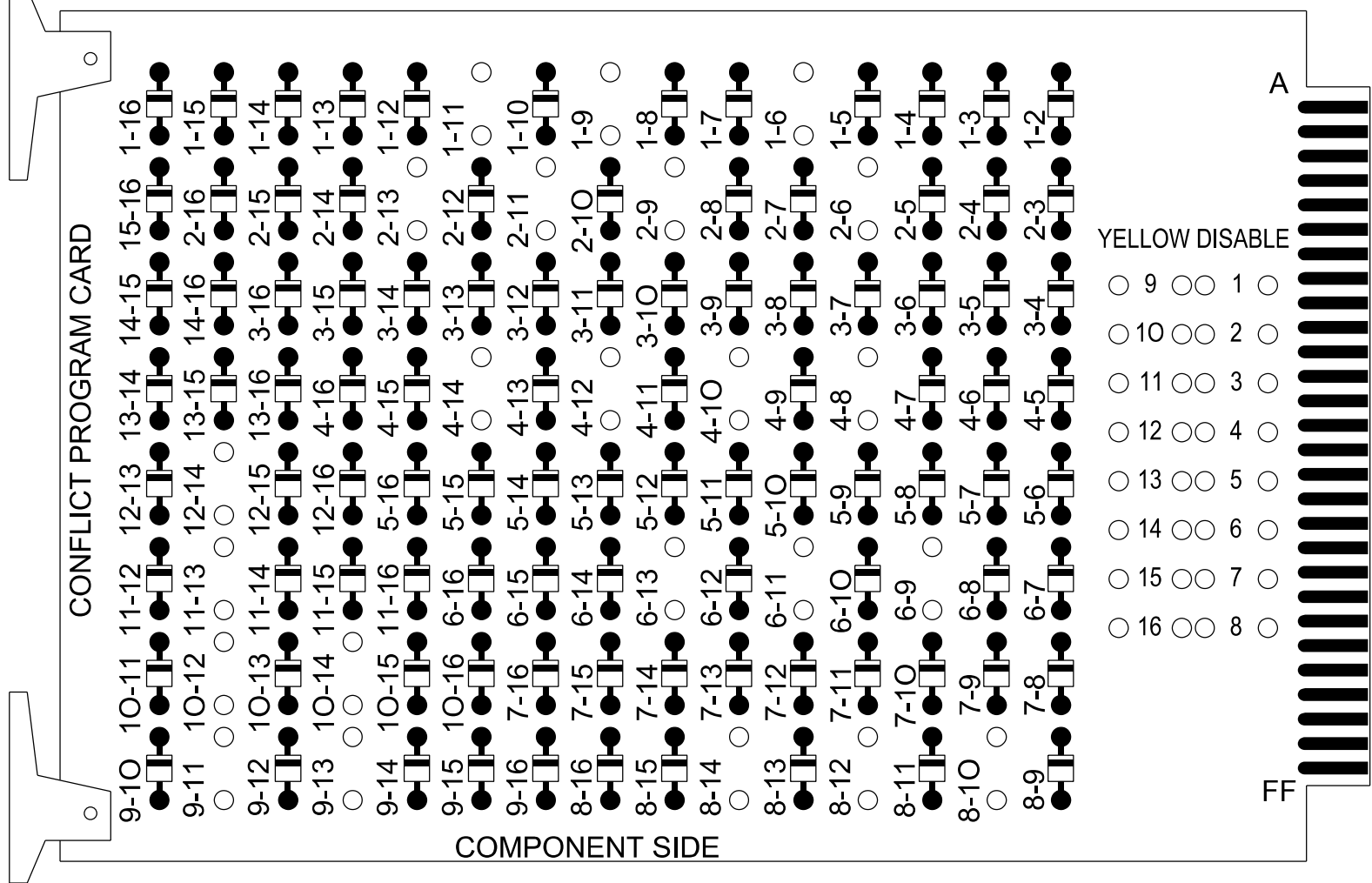
AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

16 CHANNEL CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-6, 2-9, 2-11, 2-13, 4-8, 4-10, 4-12, 4-14, 6-9, 6-11, 6-13, 8-10, 8-12, 8-14, 9-11, 9-13, 10-12, 10-14,11-13 AND 12-14.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1, 3, 5, 7, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-05 North Wilkesboro Signal System.

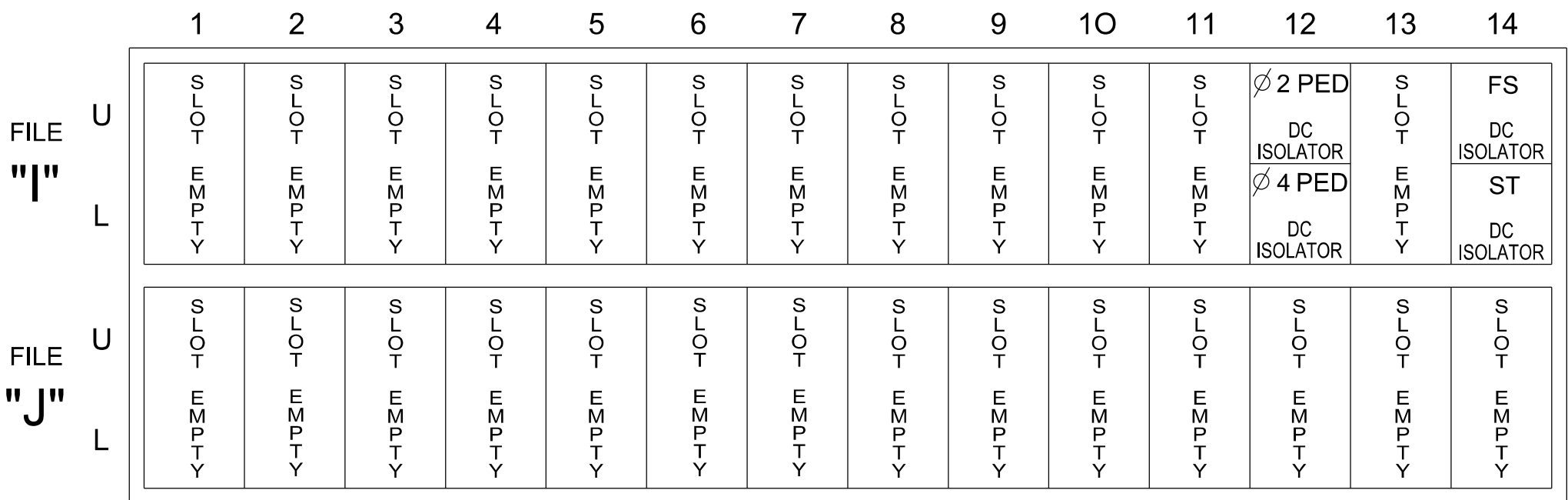
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S2P,S4, S4P, S6, S8, S9, S10, S12, S13
Phases Used.....1,2, 2PED, 4, 4PED, 6, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail on sheet 2.

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

SDLC NON-INTRUSIVE DETECTION CHART

Input Point	DETECTOR RACK #3		DETECTOR RACK #4	
	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	2C	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	4B	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	-	-	-	*	33	1	15.0		X		X	
2A	-	-	-	*	125	6			X		X	
2B	-	-	-	*	38	2			X		X	
2C	-	-	-	*	39	2			X		X	
4A	-	-	-	*	40	2			X		X	
4B	-	-	-	*	44	4	3.0		X		X	
6A	-	-	-	*	45	4	10.0		X		X	
6B	-	-	-	*	54	6			X		X	
8A	-	-	-	*	55	6			X		X	
8B	-	-	-	*	60	8	3.0		X		X	
				*	61	8	10.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOT I12.

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

Phase 1 Yellow Field Terminal (126)

AC-

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0090
DESIGNED: June 2026
SEALED: 06/05/2026
REVISED:

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	NU	NU	81,82	NU	11★	83★	NU	23★	43★	NU
RED		128			101			134			107							
YELLOW	★	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127																	
Hand icon			113			104												
Walking person icon			115			106												

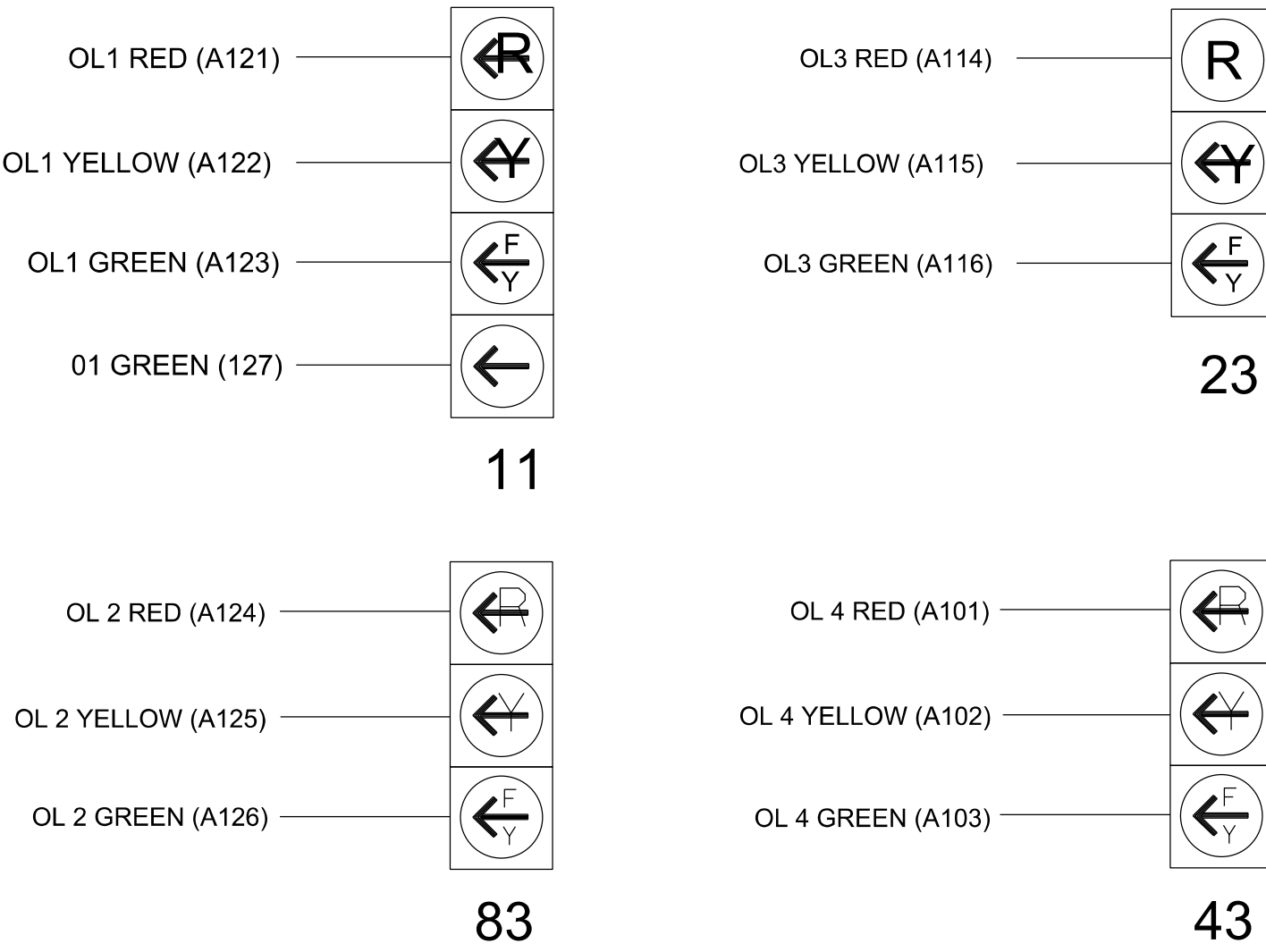
NU = Not Used

★ Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For: 750 N. Greenfield Pkwy, Garner, NC 27529 Seal of the Department of Transportation and Safety Department of Transportation and Safety North Carolina	NC 18 (Sparta Road) at Pizza Hut / Village Market Shopping Center			SEAL NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON
	Division 11		Wilkes County	N. Wilkesboro
	PLAN DATE:	June 2026	REVIEWED BY:	J O Deaton
	PREPARED BY:	M W Yalch	REVIEWED BY:	
	REVISIONS		INIT.	DATE

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	125	Is Module A Input B ON	Number	2	Number	1	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	-	-	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

OUTPUT CHANNEL CONFIGURATION

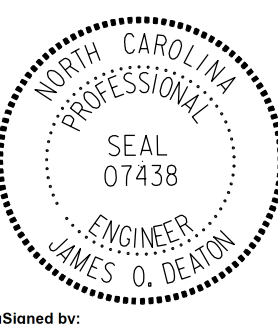
Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

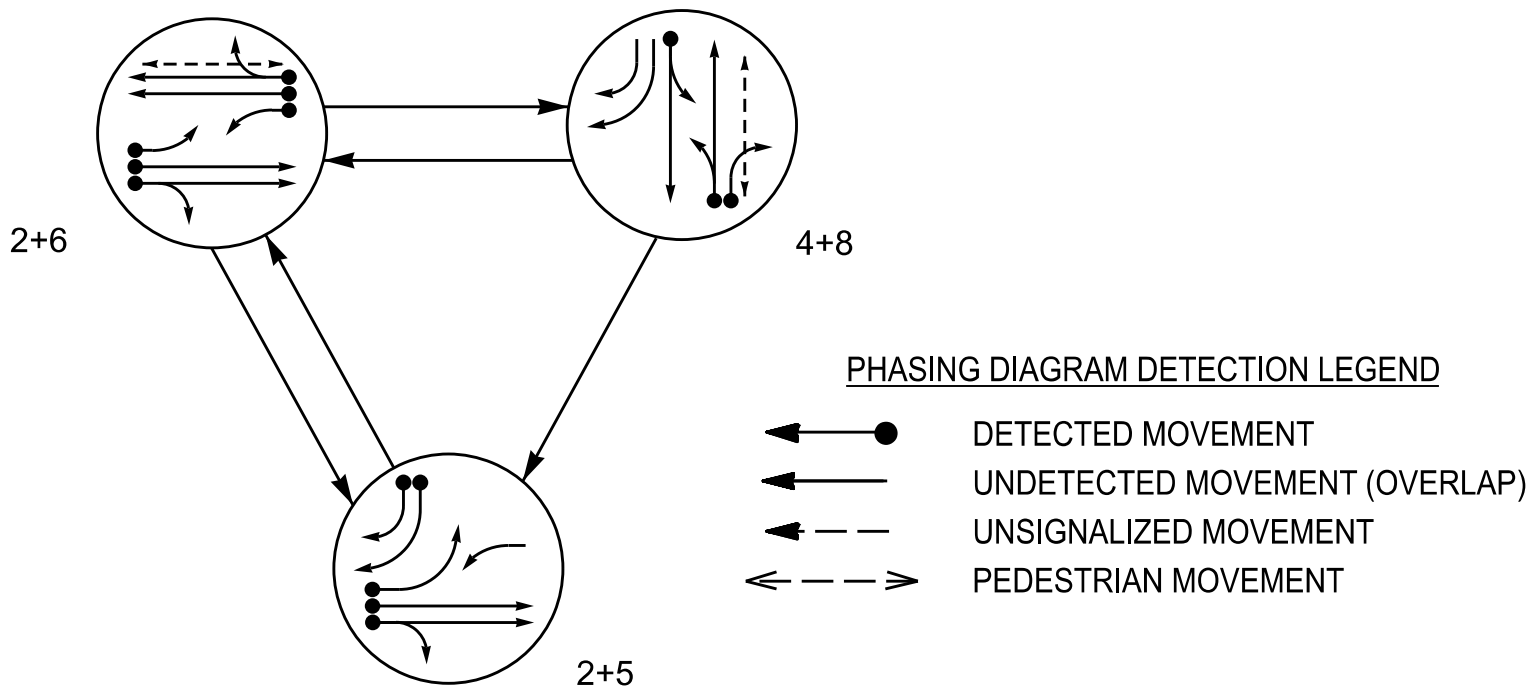
Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Electrical Detail - Sheet 2 of 2

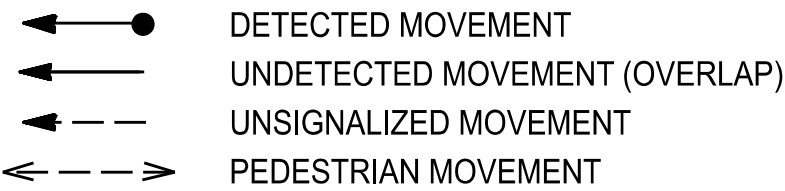
Electrical and Programming Details For:		NC 18 (Sparta Road) at Pizza Hut / Village Market Shopping Center		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		Division 11 PLAN DATE: June 2026 PREPARED BY: M W Yalch REVISIONS INIT. DATE		Wilkes County N. Wilkesboro REVIEWED BY: J O Deaton REVIEWED BY: DATE	
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0090 DESIGNED: June 2026 SEALED: 06/05/2026 REVISED:		 NC Firm License No.: F-0342 5438 Wade Park Boulevard Suite 200, Raleigh, NC 27607 Phone: 919-461-1100		 DocuSigned by: James O. Deaton 6/5/2026 401E8AC4308D40E DATE SIG. INVENTORY NO. 11-0090	

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig.1.0

PHASING DIAGRAM

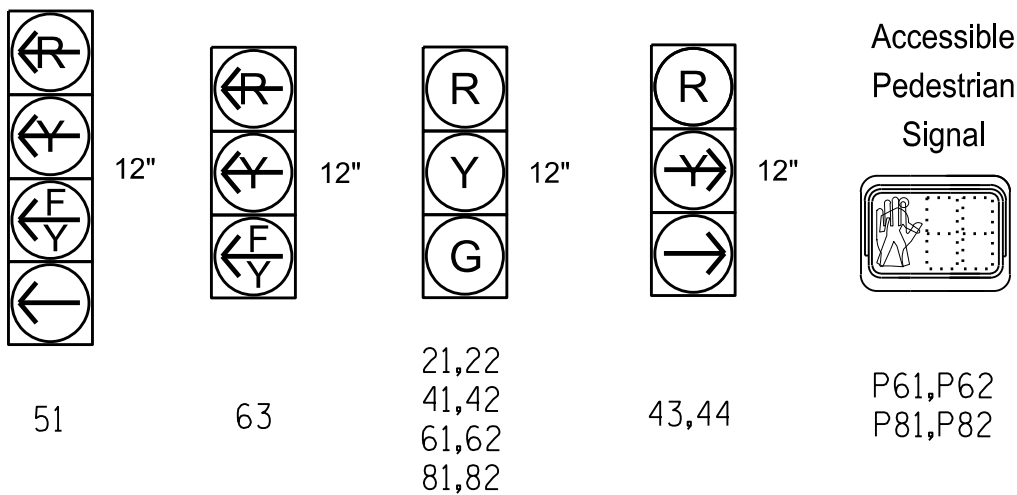


PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.



SIGNAL FACE	PHASE			
	2 + 5	2 + 6	4 + 8	2 + 5
21, 22	G	G	R	R
41, 42	R	R	G	R
43, 44	→	R	→	R
51	→	→	→	→
61, 62	R	G	R	R
63	→	→	→	→
81, 82	R	R	G	R
P61, P62	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURN	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN	NEW CARD
2A	6X6	70	*	*	2	-	-	X	-	X	*
2B	6X6	70	*	*	2	-	-	X	-	X	*
4A	6X40	0	*	*	4	3.0	-	X	-	X	*
5A	6X40	0	*	*	5	15.0	-	X	-	X	*
					2	-	-	X	-	X	*
5B	6X40	0	*	*	5	15.0	-	X	-	X	*
5C	6X40	0	*	*	5	15.0	-	X	-	X	*
6A	6X6	70	*	*	6	-	-	X	-	X	*
6B	6X6	70	*	*	6	-	-	X	-	X	*
6C	6X40	70	*	*	6	-	-	X	-	X	*
8A	6X40	0	*	*	8	3.0	-	X	-	X	*
8B	6X40	0	*	*	8	15.0	-	X	-	X	*

* Multi-zone microwave detection.

3 Phase
Fully Actuated
D11-05_North Wilkesboro

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase phase 5 may be lagged.
- Reposition existing signal heads numbered 22, 41, 61, and 62.
- Set all detector units to presence mode.
- Install new 2070LX controller in existing cabinet.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Remove Existing Right Arrow "ONLY" sign (R3-5R).
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See Roadway Design Plans for crosswalk and curb ramp locations.
- Disconnect and abandon existing system loops S3 and S4.

LEGEND

PROPOSED	EXISTING

MAXTIME TIMING CHART					
FEATURE	2	4	5	6	8
Walk *	-	-	-	7	7
Ped Clear	-	-	-	26	18
Min Green *	10	7	7	10	7
Passage *	3.0	2.0	2.0	3.0	2.0
Max 1 *	50	20	25	50	20
Yellow Change	4.2	4.2	4.0	4.2	4.2
Red Clear	2.7	2.5	2.6	2.7	2.5
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Advance Walk	-	-	-	7	7
Non Lock Detector	-	X	X	-	X
Vehicle Recall	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	X	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sunset Drive.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sunset Drive.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sparta Road.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Sparta Road.

Signal Upgrade

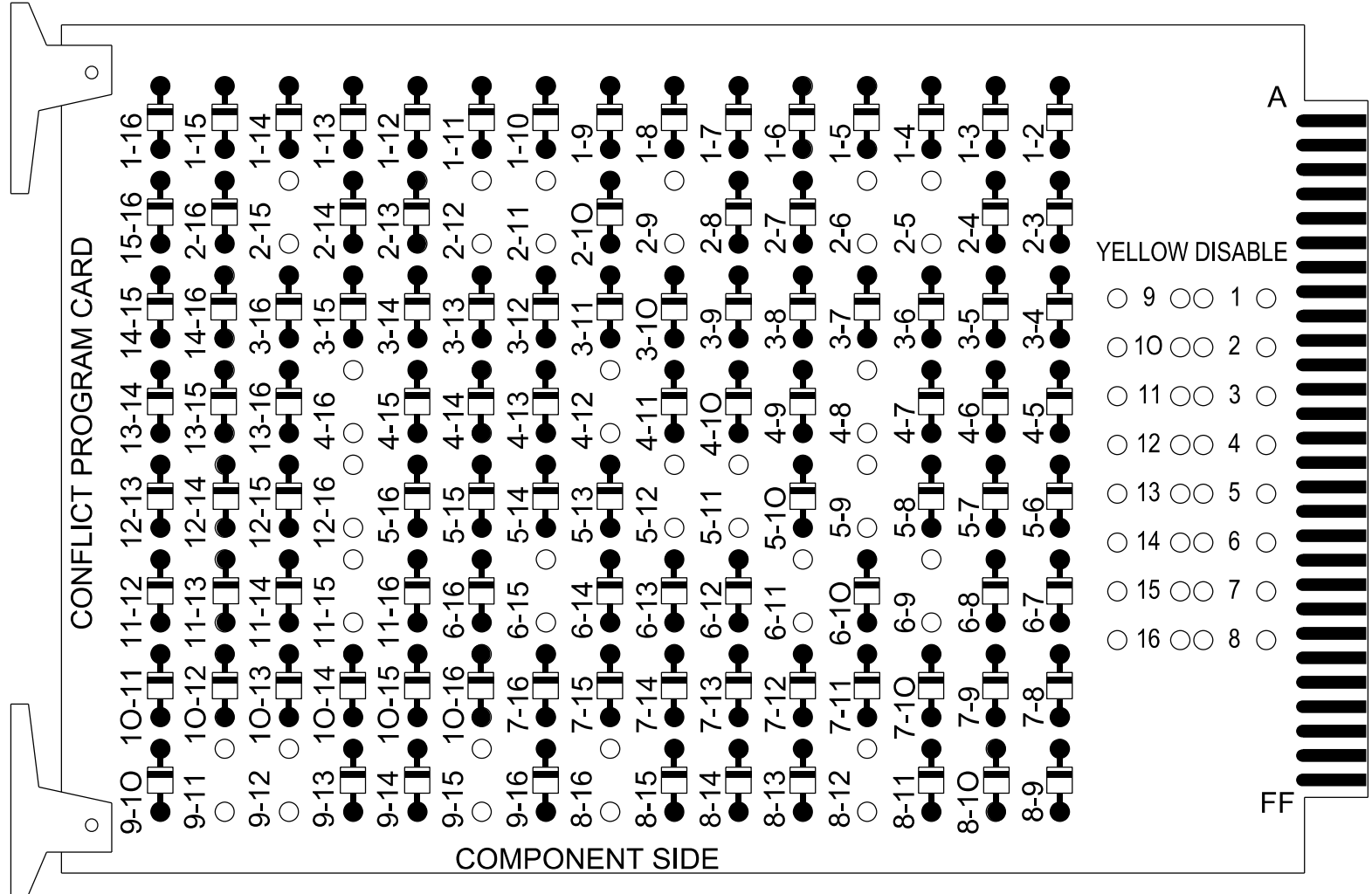
Prepared for the Offices of: Signal Design Section		NC 18 (Sparta Road) at SR 1517 (Sunset Drive) and Grandview Drive		Division 11 Wilkes County North Wilkesboro		SEAL THURGOOD LAW PROFESSIONAL SEAL 056268 ENGINEER YU-DONG HAN	
750 N. Greenfield Pkwy, Garner, NC 27529		PLAN DATE: June 2026		REVIEWED BY: R. Garrett		Signed by: 6/4/2026	
PREPARED BY: X. Han		REVISIONS		INIT.		DATE	
0		SCALE		1"=20'		SHEET NO. 11-1120	

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-12, 2-15, 4-8, 4-12, 4-16, 5-9, 5-11, 5-12, 6-9, 6-11, 6-15, 8-12, 8-16, 9-11, 9-12, 9-15, 11-15 AND 12-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1, 3, 5, 7, 10, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-05_North Wilkesboro System.

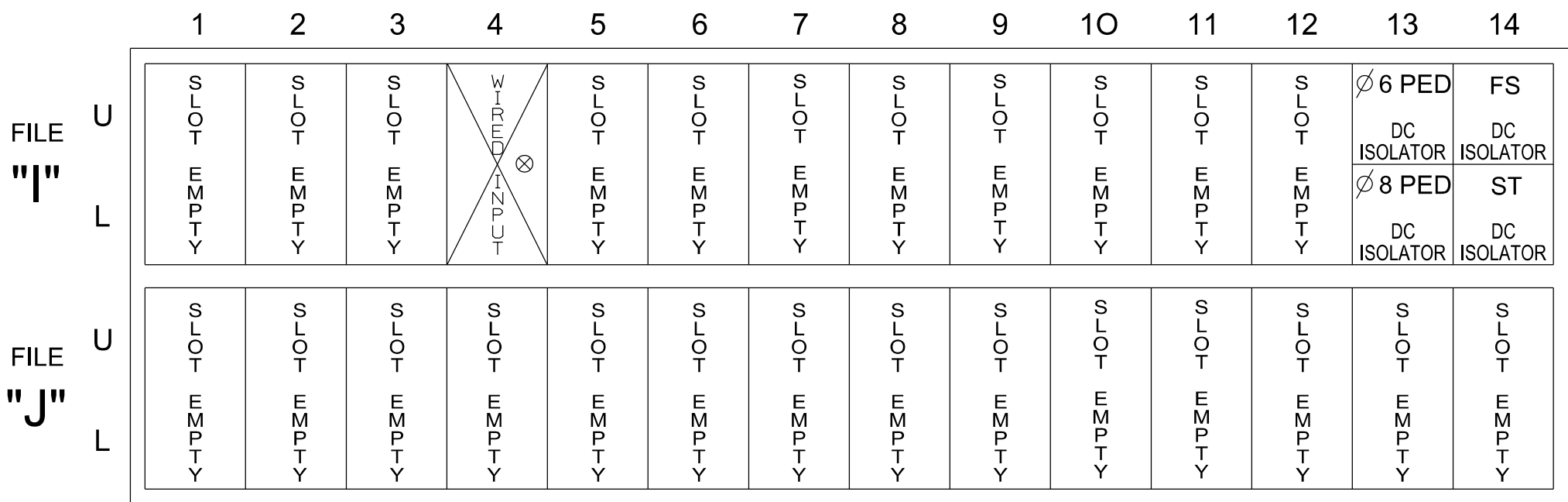
EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S4, S5, S6, S6P, S8, S8P, S9, S12, S13
Phases Used.....2, 4, 5, 6, 6PED, 8, 8PED
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail on sheet 2.

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

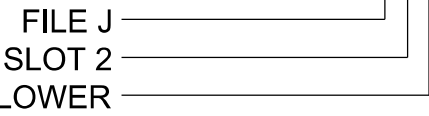
NOTE: IF PRESENT, REMOVE EXISTING JUMPERS ASSOCIATED W/ DETECTOR SLOT I4 FROM REAR OF INPUT FILE.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4	3.0		X		X	
5A	-	-	-	*	35	5	15.0		X		X	
5B	-	-	-	*	127	2			X		X	
5C	-	-	-	*	51	5	15.0		X		X	
6A	-	-	-	*	37	5	15.0		X		X	
6B	-	-	-	*	54	6			X		X	
6C	-	-	-	*	55	6			X		X	
8A	-	-	-	*	56	6			X		X	
8B	-	-	-	*	60	8	3.0		X		X	
				*	61	8	15.0		X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6	NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.					
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	P61, P62	NU	81,82	P81, P82	63	NU	NU	51	43,44	NU
RED		128			101			134			107						A101	
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115	A102	
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							133										A103	
Hand icon									119			110						
Walking person icon									121			112						

NU = Not Used

* Denotes install load resistor. See LOAD RESISTOR INSTALLATION DETAIL this sheet.

* See pictorial of head wiring in FYA SIGNAL WIRING DETAIL on sheet 2.

SDLC NON-INTRUSIVE DETECTION CHART

	DETECTOR RACK #3		DETECTOR RACK #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	5A	51	5B
4	36	NU	52	NU
5	37	5C	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	6C
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

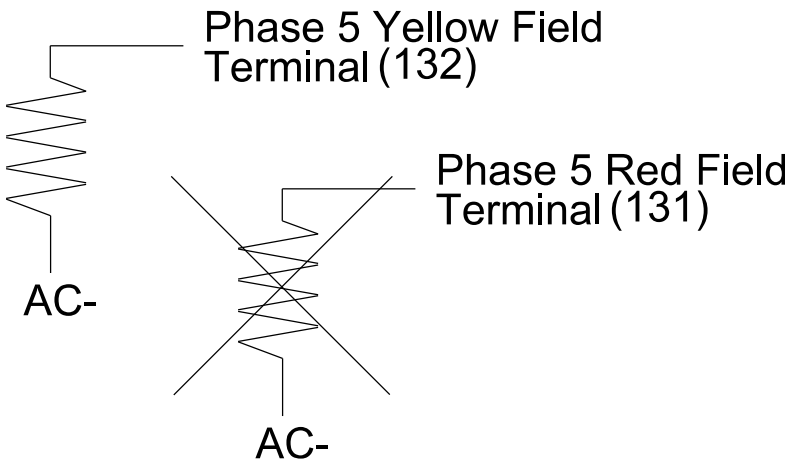
NU = Not Used

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1120
DESIGNED: June 2026
SEALED: 06/04/26
REVISED:

LOAD RESISTOR INSTALLATION DETAIL

(install and remove resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:	NC 18 (Sparta Road) at SR 1517 (Sunset Drive) and Grandview Drive	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of:	Division 11 Wilkes County North Wilkesboro	SEAL
PLAN DATE: June 2026	REVIEWED BY: J O Deaton	NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON
PREPARED BY: M W Yalch	REVIEWED BY:	
REVISIONS	INIT.	DATE
750 N. Greenfield Pkwy, Garner, NC 27529		
DocuSigned by: James O. Deaton		6/5/2026
40FF8AC439B040F		DATE
SIG. INVENTORY NO.		11-1120

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	Off	FYA 4 - Section	Normal
Included Phases	2	-	6	4,5
Modifier Phases	-	-	5	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	127	Is Module A Input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 35 to vehicle detector 127

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

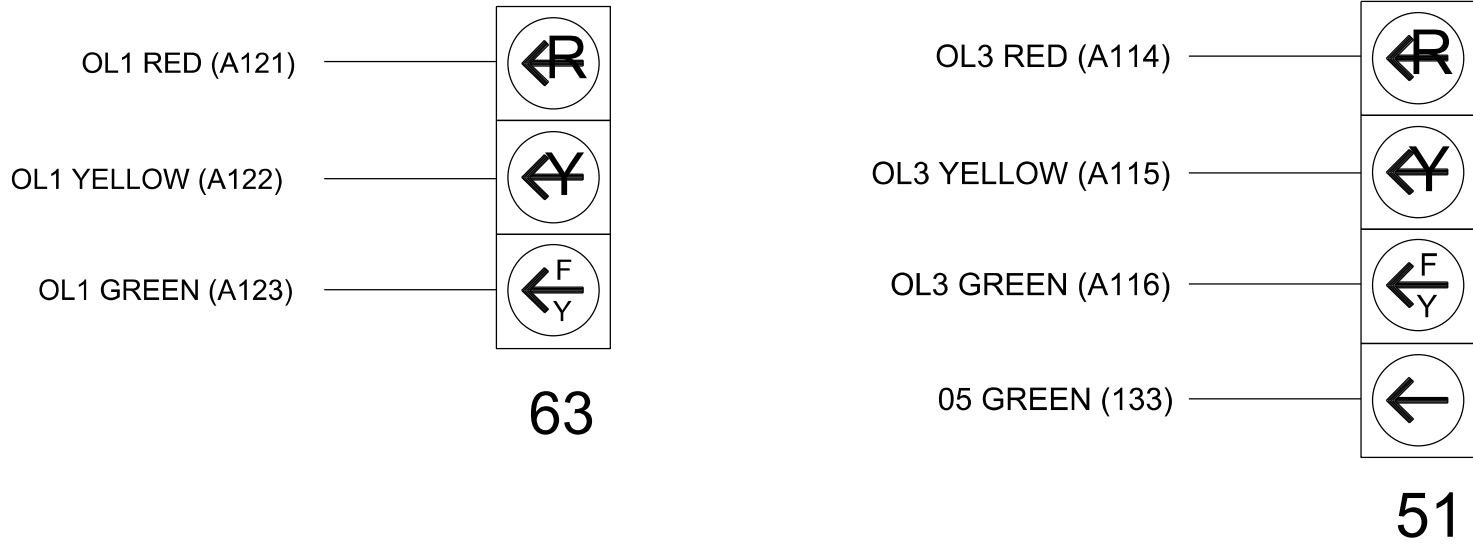
Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

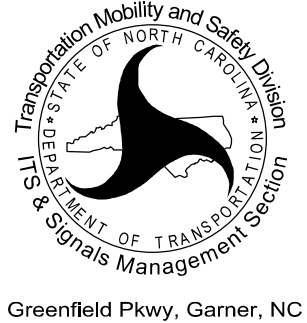
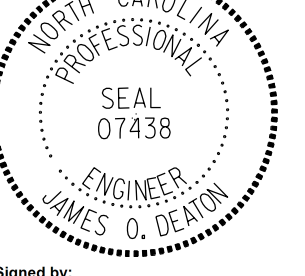
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1120
DESIGNED: June 2026
SEALED: 06/04/26
REVISED:

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:		NC 18 (Sparta Road) at SR 1517 (Sunset Drive) and Grandview Drive		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		Wilkes County North Wilkesboro		SEAL 	
Division 11		PLAN DATE: June 2026		REVIEWED BY: J O Deaton	
PREPARED BY: M W Yalch		REVIEWED BY:		DocuSigned by: James O. Deaton 40FF8A8A365D46F	
REVISIONS		INIT.		DATE	
				6/5/2026	
				DATE	
				SIG. INVENTORY NO. 11-1120	

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NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Figure 1 shows a directed graph with three nodes. The top-left node is labeled $2+6$ and contains two parallel solid arrows and a dashed arrow. The top-right node is labeled 9 and contains a dashed arrow and a curved arrow. The bottom node is labeled 4 and contains a curved arrow and a dashed arrow. Directed edges connect the $2+6$ node to the 9 node, the $2+6$ node to the 4 node, and the 9 node to the 4 node.

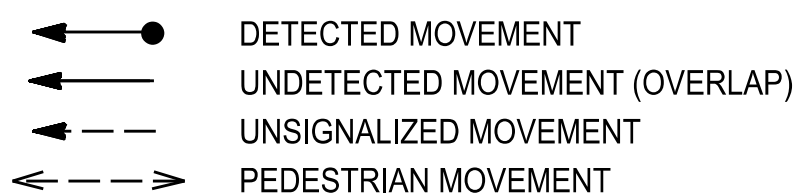
TABLE OF OPERATION				
SIGNAL FACE	PHASE			
	2 + 6	4	9	FLASH
21, 22	G	R	R	R
41	R	←	R	R
42	R		R	R
43	R	G	R	R
61, 62	G	R	R	R
P21, P22	W	DW	DW	DRK
P91, P92	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	70	*	X	2	-	-	X	-	X	-	*
2B	6X6	70	*	X	2	-	-	X	-	X	-	*
4A	6X40	0	*	X	4	-	-	X	-	X	-	*
4B	6X40	0	*	X	4	5.0	-	X	-	X	-	*
6A	6X6	70	*	X	6	-	-	X	-	X	-	*
6B	6X6	70	*	X	6	-	-	X	-	X	-	*

* Multi-zone microwave detection

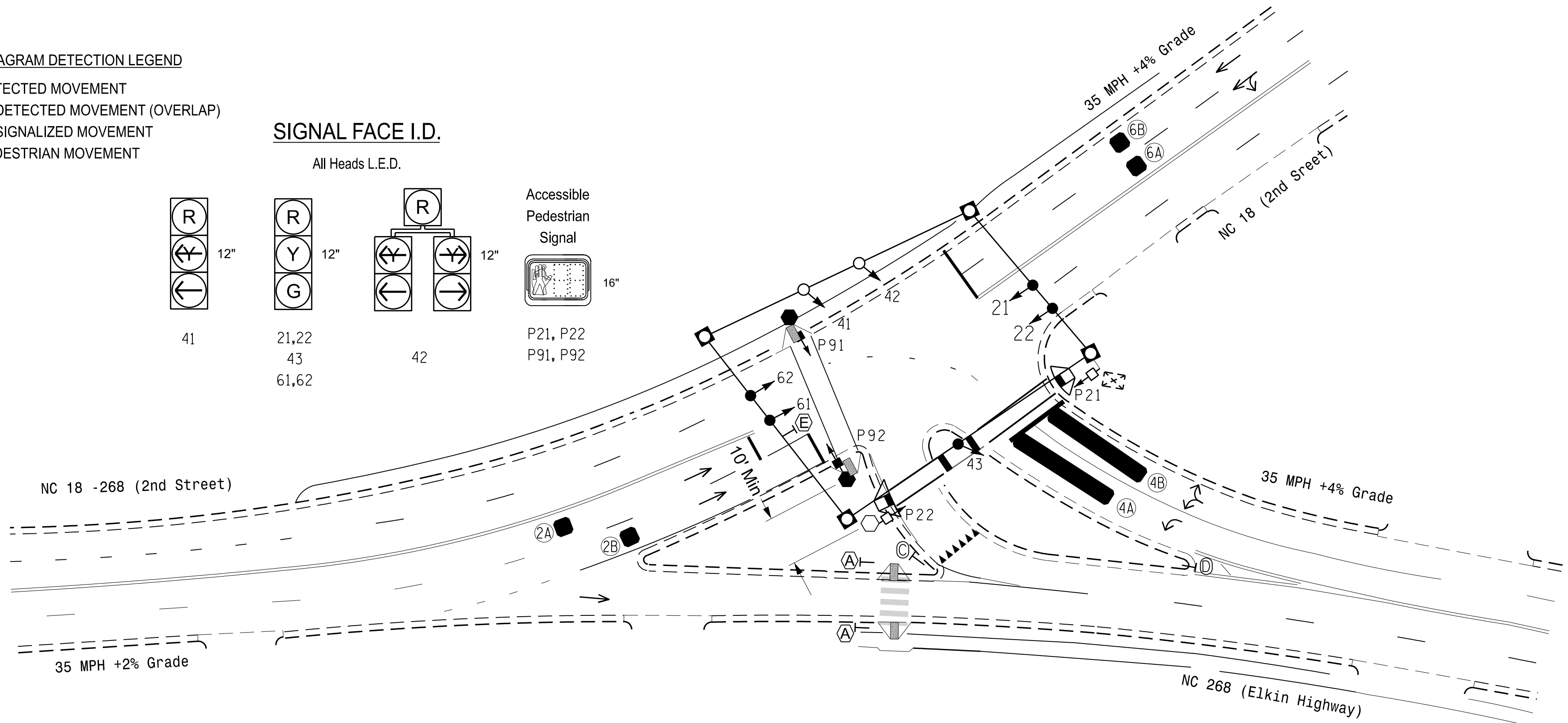
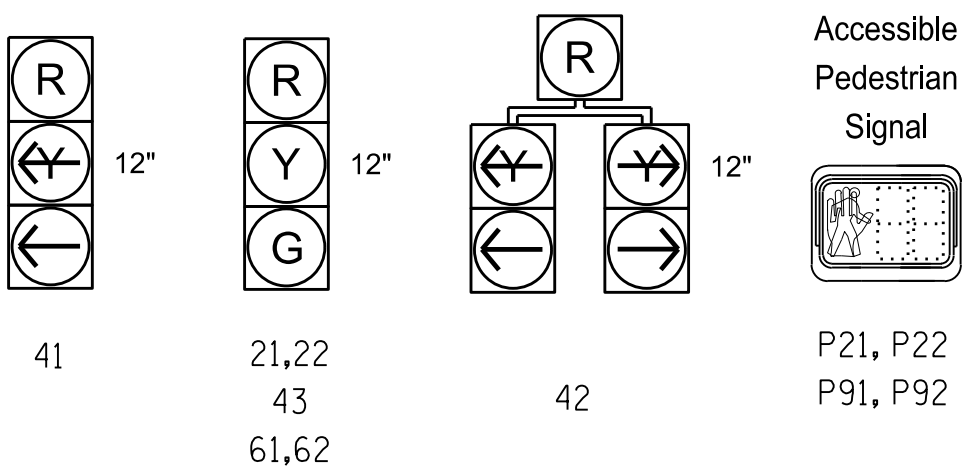
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Install new 2070LX controller in existing cabinet.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Replace existing pushbuttons with APS Pushbuttons.
8. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
9. Remove Existing signs: Left Arrow "ONLY" (R3-5L), Dual Turn Arrows (R3-18), and "TURNING VEHICLES" With Left Arrow "YIELD TO" Pedestrian (R10-15).
10. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
12. See Roadway Design Plans for crosswalk and curb ramp locations.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.



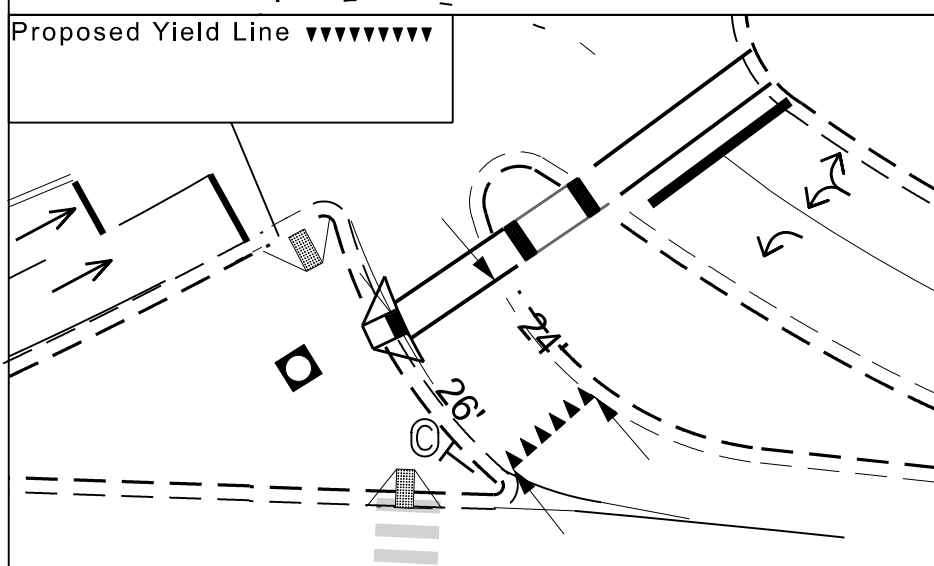
MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	9 PED
Walk *	7	-	-	7
Ped Clear	17	-	-	10
Min Green *	10	7	10	7
Passage *	3.0	2.0	3.0	-
Max 1 *	45	25	45	17
Yellow Change	3.7	3.0	3.7	3.0
Red Clear	2.0	2.9	2.0	2.9
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	6	-	-	-
Non Lock Detector	-	X	-	-
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	-	-	-
Simultaneous Start **	X	-	X	-

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

** Program phases 2 and 6 for Simultaneous Start for LPI.

** Program phases 2 and 6 for Simultaneous Start for LPI.

Proposed Yield Line Locations



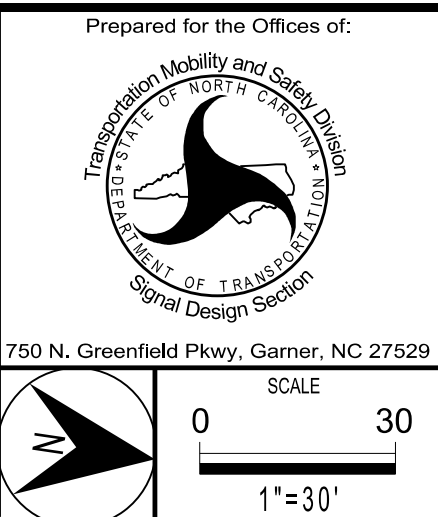
ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Elkin Highway.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Elkin Highway.
P91	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross 2nd Street.
P92	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross 2nd Street.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
	Metal Strain Pole	
	Pedestrian Crossing Sign (W11-2) w/ Downward Diagonal Arrow Plaque (W16-7p)	
	"YIELD" Sign (R1-2)	
	Keep Right Sign (R4-7A)	
	"TURNING VEHICLES" With Left Arrow	
	"YIELD TO" Pedestrian Sign (R10-15)	
	Non-Intrusive Detection Zone	
N/A	Curb Ramp	

Signal Upgrade



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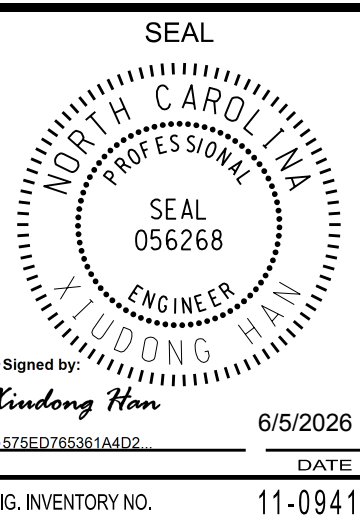
NC 18-268 / NC 18 (2nd Street)
at
NC 268 (Elkin Highway)

Division 11 Wilkes County North Wilksboro

FORN DATE:	July 2020	REVIEWED BY:	R. Garrett
PREPARED BY:	Y. Han	REVIEWED BY:	

REVISIONS	INIT.	DATE
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



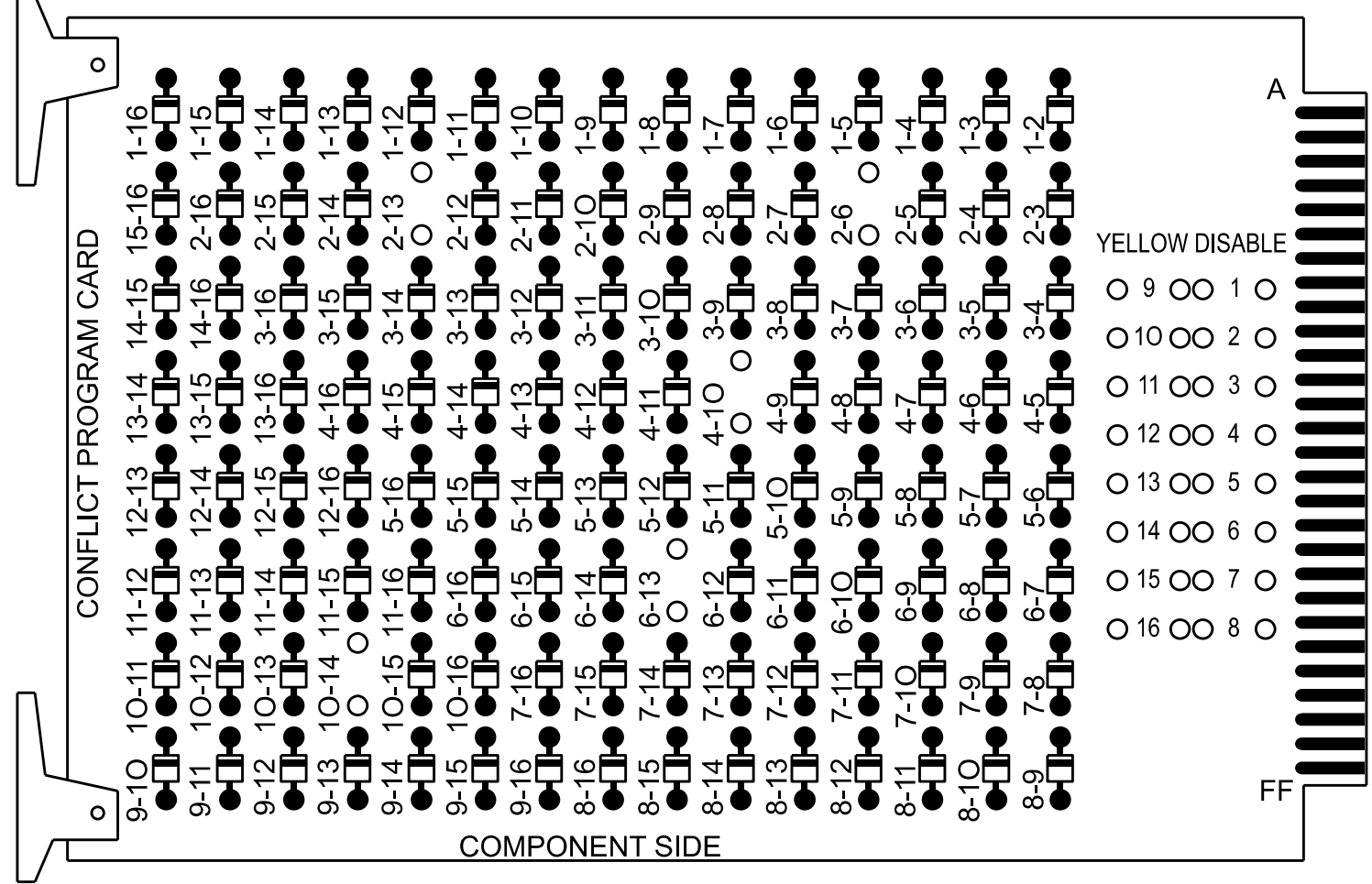
IG. INVENTORY NO. 11-0941

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HONG

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

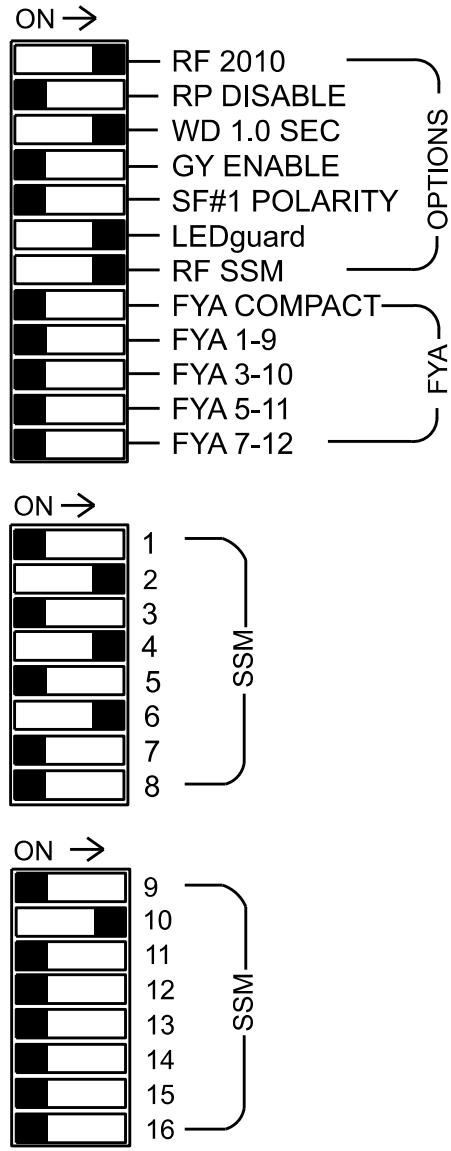
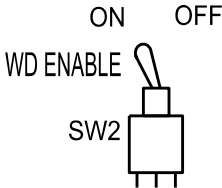
REMOVE DIODE JUMPERS 2-6, 2-13, 4-10, 10-14 AND 6-13.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1, 3, 5, 7, 8, 9, 11, 12, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6 for Simultaneous Start.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D11-05 North Wilkesboro System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 with Aux. Output File
Load Switches Used.....S2, S2P, S4, S4P, S6, AUX S2
Phases Used.....2, 2PED, 4, 6, **9, 9PED
Overlap "1".....Not Used
Overlap "2".....*
Overlap "3".....Not Used
Overlap "4".....Not Used

* See overlap programming detail on sheet 2.
**Phase used for timing purposes only.

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig. 1.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	8 # PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	43	NU	61,62	NU	NU	NU	NU	NU	42	NU	NU	NU	NU
RED		128			101	101		134						*				
YELLOW		129				102		135										
GREEN		130				103		136										
RED ARROW																		
YELLOW ARROW					102									A125				
GREEN ARROW					103									A126				
Hand icon			113				104											
Walking person icon			115				106											

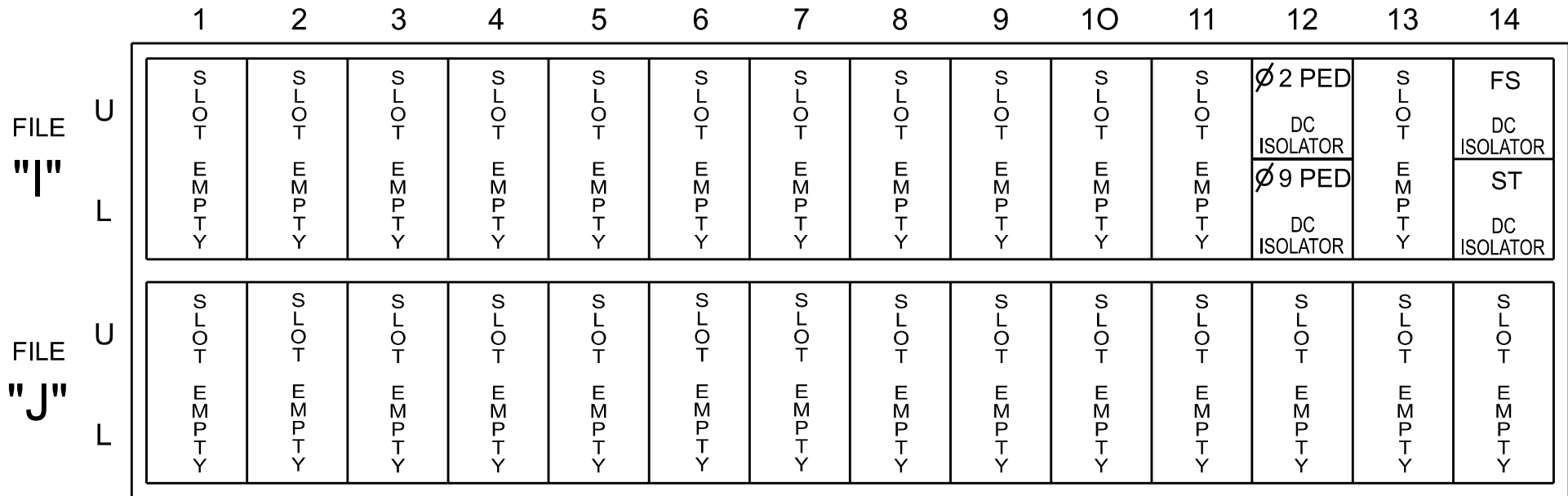
NU = Not Used

* Denotes install load resistor. See LOAD RESISTOR INSTALLATION DETAIL this sheet.

Loadswitches reassigned. See OUTPUT CHANNEL CONFIGURATION on sheet 2.

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

SDLC NON-INTRUSIVE DETECTION CHART

	DETECTOR RACK #3		DETECTOR RACK #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	2B	55	6B
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	NU
13	45	4B	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

INPUT FILE CONNECTION & PROGRAMMING CHART

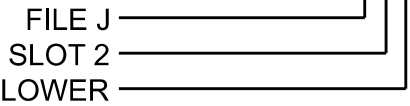
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
2B	-	-	-	*	39	2			X		X	
4A	-	-	-	*	44	4			X		X	
4B	-	-	-	*	45	4	5.0		X		X	
6A	-	-	-	*	54	6			X		X	
6B	-	-	-	*	55	6			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P91,P92	TB8-5,6	I12L	69	35	4	PED 9 %						

NOTE:
INSTALL DC ISOLATOR
IN INPUT FILE SLOT 112.

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

% See PED DETECTOR PROGRAMMING DETAIL on sheet 2.

INPUT FILE POSITION LEGEND: J2L



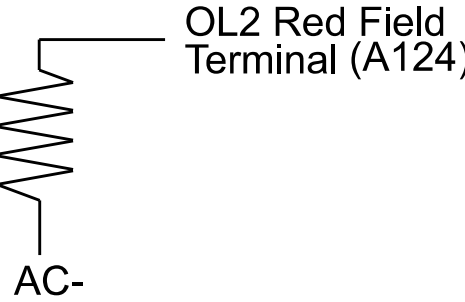
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

LOAD RESISTOR INSTALLATION DETAIL

(install and remove resistor as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0941
DESIGNED: June 2026
SEALED: 06/05/26
REVISED: N/A

SPECIAL DETECTOR NOTE

For all zones, install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:		NC 18-268 / NC 18 (2nd Street) at NC 268 (Elkin Highway)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		Division 11 Wilkes County North Wilkesboro		SEAL	
PLAN DATE: June 2026		REVIEWED BY: J O Deaton			
PREPARED BY: M W Yalch		REVIEWED BY:			
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529				DocuSigned by: James O. Deaton 6/7/2026	
				DATE	
				SIG. INVENTORY NO. 11-0941	

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OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

Overlap	1	2	3	4
Type	Off	Normal	Off	Off
Included Phases	-	4,9	-	-
Modifier Phases	-	-	-	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options
☒ Disable TS2 Cabinet Alarms

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Ring	Sequence Data
1	2,a,9,b,4,c
2	6,a,b,c

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	9				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE PED 9
ASSIGNED TO CHANNEL 14

PED DETECTOR PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Detector >Ped Det Plans

Web Interface
Home >Controller >Detector Configuration >Pedestrian Detector

Plan 1

Detector	Descriptor	Call Phase	Call Overlap
2		2	0
4		9	0
6		6	0
8		8	0

NOTE
DET. 4 CALLS
PHASE 9

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0941
DESIGNED: June 2026
SEALED: 06/05/26
REVISED: N/A

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

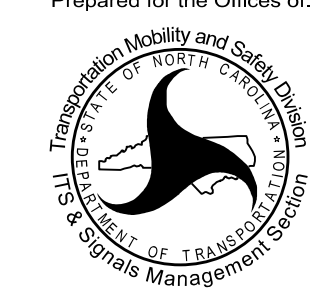
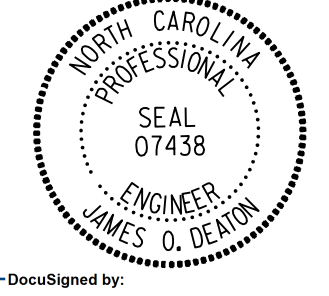
Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

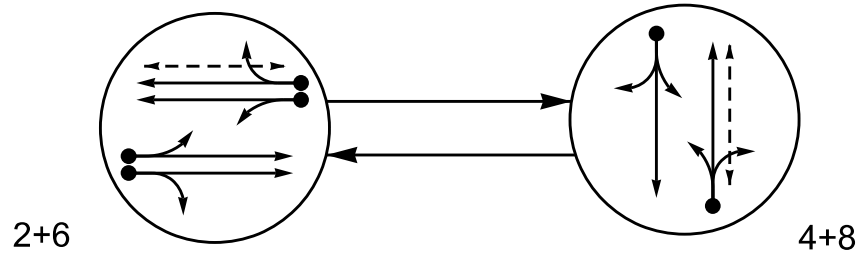
All Red Flash Exit Time
6

Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:		NC 18-268 / NC 18 (2nd Street) at NC 268 (Elkin Highway)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		Division 11Wilkes CountyNorth Wilkesboro		SEAL	
		PLAN DATE: June 2026REVIEWED BY: J O Deaton			
		PREPARED BY: M W YalchREVIEWED BY:		DocuSigned by James O. Deaton6/7/2026	
		REVISIONS		INIT. DATE	
				SIG. INVENTORY NO. 11-0941	

PROJECT REFERENCE NO.	SHEET NO.
TAP	Sig.1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←---> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	F L A S H
21, 22	G	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DURING GREEN
2A, 2B	6X6	70	3	-	2	-	-	X	-	X
4A	6X60	0	2-4-2	-	4	3.0	-	X	-	X
6A, 6B	6X6	70	3	-	6	-	-	X	-	X
8A	6X60	0	2-4-2	-	8	3.0	-	X	-	X

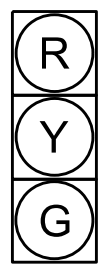
2 Phase
Fully Actuated
D11-05_North Wilkesboro

NOTES

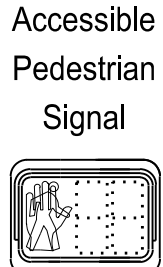
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
- Install new 2070LX controller in existing cabinet.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See Roadway Design Plans for crosswalk and curb ramp locations.

SIGNAL FACE I.D.

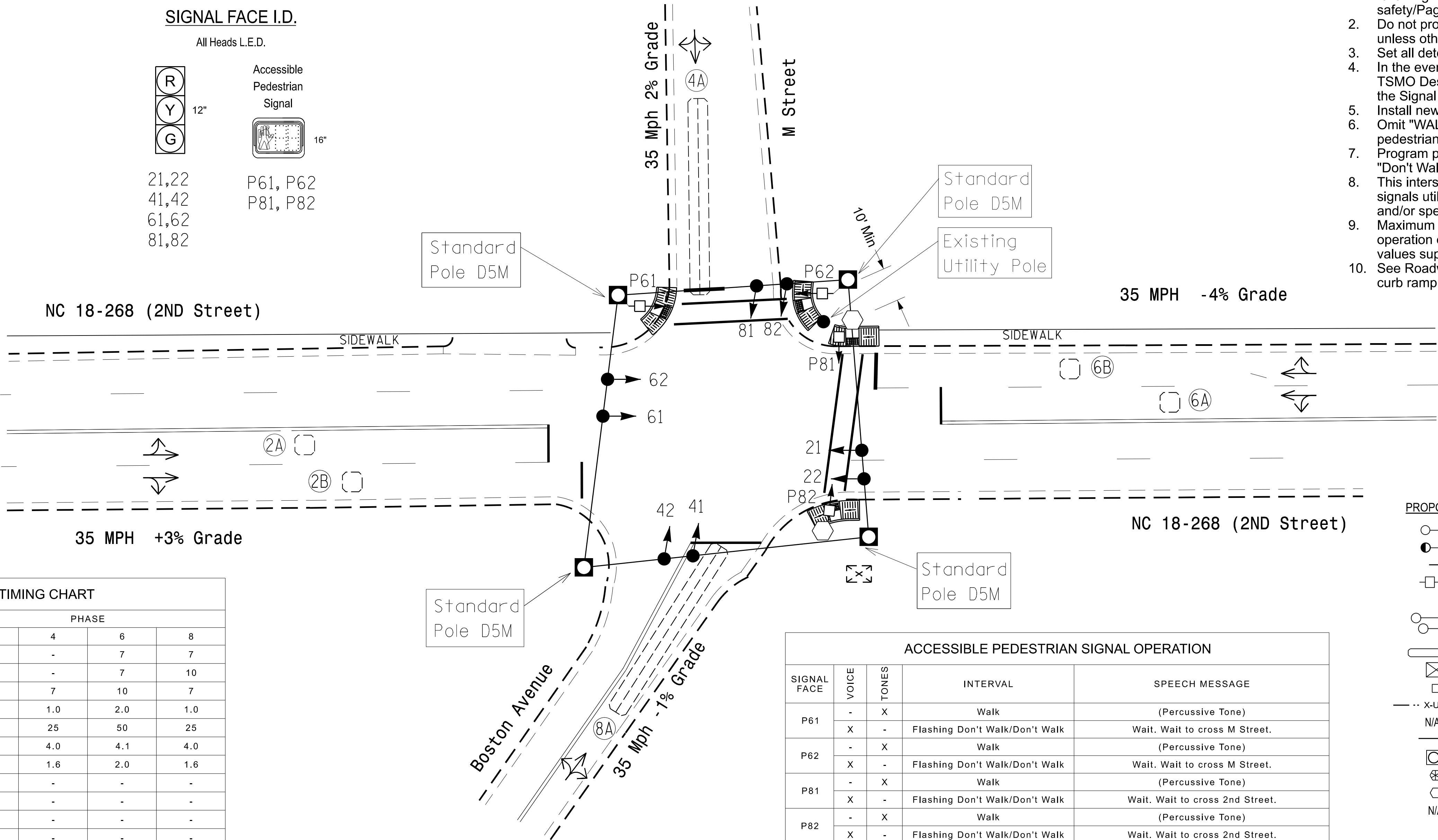
All Heads L.E.D.



21,22
41,42
61,62
81,82



P61, P62
P81, P82



MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	-	-	7	7
Ped Clear	-	-	7	10
Min Green *	10	7	10	7
Passage *	2.0	1.0	2.0	1.0
Max 1 *	50	25	50	25
Yellow Change	4.1	4.0	4.1	4.0
Red Clear	2.0	1.6	2.0	1.6
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	6	4
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Start **	X	X	X	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

** Program phases 2&6 and 4&8 for Simultaneous Start for LPI.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross M Street.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross M Street.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross 2nd Street.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross 2nd Street.

PROPOSED

- Traffic Signal Head
- Modified Signal Head
- ⊥ Sign
- ⊥ Pedestrian Signal Head
- With Push Button & Sign
- Signal Pole with Guy
- Signal Pole with Sidewalk Guy
- ⊗ Inductive Loop Detector
- Controller & Cabinet
- Junction Box
- X-UC --- 2-in Underground Conduit
- N/A Right of Way
- Directional Arrow
- ⊗ Metal Strain Pole
- ⊗ Type I Pushbutton Post
- Type II Signal Pedestal
- N/A Curb Ramp

LEGEND

EXISTING

- N/A
- ⊥
- ⊥
-
-
-
- ⊗
- ⊗
- ⊗
- UC ---
-
- ⊗
- ⊗
- ⊗

Signal Upgrade

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		NC 18-268 (2nd Street) at Boston Avenue and M Street		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 056268 YIUDONG HAN	
Division 11 Wilkes County North Wilkesboro		PLAN DATE: May 2026 REVIEWED BY: R. Garrett		SIGNED BY: <i>Xindong Han</i> 5/28/2026	
PREPARED BY: X. Han		REVIEWED BY:		DATE:	
REVISIONS		INIT.		DATE	
0		SCALE		1"=20'	
SIG. INVENTORY NO.		DATE		11-0942	

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

A circular professional engineer seal for the State of North Carolina. The outer ring contains the text "NORTH CAROLINA" at the top and "STATE OF" at the bottom. Inside the ring, the words "PROFESSIONAL" and "ENGINEER" are written in a larger font, with "SEAL" and the number "07438" in the center. The name "JAMES O. DEATON" is written in a script font across the bottom of the seal.

DocuSigned by:
James O. Deaton 5/29/2026

40FE8AC430BD40F- DATE

SIG. INVENTORY NO. 11-0942

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2		X		2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6		X	X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1		X	X	9
10	Overlap	2		X	X	10
11	Overlap	3		X		11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

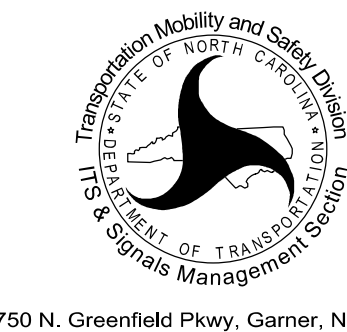
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0942
DESIGNED: May 2026
SEALED: 05/28/2026
REVISED:

AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200, Raleigh, NC 27607
Phone: 919-461-1100

Electrical Detail - Sheet 2 of 2

Electrical and Programming
Details For

Prepared for the Offices of



NC 18-268 (2nd Street)
at
Boston Avenue and M Street

Division 11 Wilkes County North Wilkesboro

PLAN DATE: May 2026	REVIEWED BY: J O Deaton
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PREPARED BY: M W Yalch	REVIEWED BY:
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REVISIONS		INIT	DATE
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REVISIONS	INIT.	DATE

[illegible]

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
07438
ENGINEER
JAMES O. DEATON

DocuSigned by:

James O. Deaton 5/29/2026

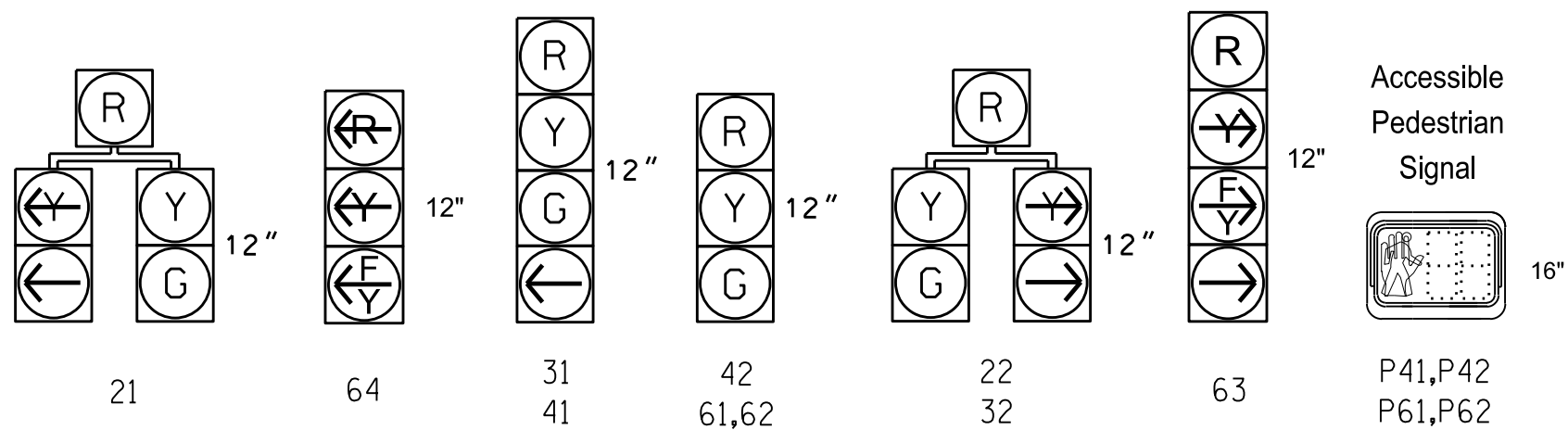
40FF8AC4308D40F... DATE

SIG. INVENTORY NO. 11-0942

Figure 1 shows four nodes in a directed graph, each representing a different configuration of a system. The nodes are labeled 2+6, 2+5, 3, and 4. Each node contains a diagram of a circle with internal elements (dots, lines, arrows) and a label below it. The nodes are connected by directed edges forming a cycle: 2+6 to 3, 3 to 4, 4 to 2+5, and 2+5 to 2+6. There are also self-loops on each node.

SIGNAL FACE	PHASE			
	2 + 5	2 + 6	3	4 F L S H
21		G	R	R
22	G	G		R
31	G	R		R
32		R	G	R
41	R	R	R	
42	R	R	R	G
61, 62	R	G	R	R
63	R		→	R
64				
P41, P42	DW	DW	DW	DRK
P61, P62	DW	W	DW	DRK

All Heads L.E.D.



DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOP LINE (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN	NEW CARD
2A, 2B	6X6	70	*	*	2	-	-	X	-	X	-
3A	6X60	0	*	*	3	3.0	-	X	-	X	-
3B	6X60	0	*	*	3	-	-	X	-	X	-
3C	6X60	0	*	*	3	15.0	-	X	-	X	-
4A	6X40	0	*	*	4	3.0	-	X	-	X	-
4B	6X50	0	*	*	4	10.0	-	X	-	X	-
6A, 6B	6X6	70	*	*	6	-	-	X	-	X	-
6C	6X60	0	*	*	6	-	-	X	-	X	-

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Program controller to clear from phase 2+6 to phase 2+5 by progressing through phase 4 (see Electrical Details).
4. The order of phase 3 and phase 4 may be reversed.
5. Reposition existing signal heads numbered 61 and 62.
6. Set all detector units to presence mode.
7. Install new 18 channel cabinet with 2070LX controller on existing foundation.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
11. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
12. See Roadway Design Plans for crosswalk and curb ramp locations.

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

MAXTIME TIMING CHART					
FEATURE	PHASE				
	2	3	4	5	6
Walk *	-	-	7	-	7
Ped Clear	-	-	20	-	16
Min Green *	10	7	7	7	10
Passage *	3.0	2.0	2.0	2.0	3.0
Max 1 *	40	30	15	15	40
Yellow Change	4.0	4.3	3.0	3.0	4.0
Red Clear	2.1	2.2	2.9	3.1	2.1
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Advance Walk	-	-	6	-	7
Non Lock Detector	-	X	X	X	-
Vehicle Recall	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-
Simultaneous Start **	X	-	-	-	X

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross West D Street.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross West D Street.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Boone Trail.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk/Don't Walk	Wait. Wait to cross Boone Trail.

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
... x-UC ...	2-in Underground Conduit	... UC ...
N/A	Right of Way	
	Directional Arrow	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	Combined Through and Left Arrow Sign (R3-6L)	(B)
	Type II Signal Pedestal	
N/A	Curb Ramp	
	Non-Intrusive Detection Zone	

Prepared for the Offices of:



AECOM
NC Firm License No.: F-0342
5438 Wade Park Boulevard
Suite 200 Raleigh, NC 27607
Phone: 919-461-1100

Division 11 Wilkes County North Wilkesboro

PLAN DATE:	June 2026	REVIEWED BY:	R. Garrett
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PREPARED BY:	X. Han	REVIEWED BY:
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REVISIONS	INIT.	DATE
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

A circular professional engineer seal for the State of North Carolina. The outer ring contains the text "NORTH CAROLINA" at the top and "XU DONG HAN" at the bottom. Inside this ring, the words "PROFESSIONAL" and "ENGINEER" are written along the upper and lower arcs respectively. In the center of the seal, it reads "SEAL" above the number "056268".

Seal of the Professional Engineer, State of North Carolina
No. 056268
XU DONG HAN

Signed by: *Xu Dong Han* Date: 6/4/2026

IG. INVENTORY NO. 575ED765361AA02 DATE 11-0927

(install and remove resistors as shown)

Phase 5 Red Field
Terminal (131)



AC-

(wire signal head as shown)



Front Panel
Main Menu >Controller >Sequence & Phs Config >Backup Prevention >
Backup Protection Plan

Web Interface
Home >Controller> Backup Prevention >Backup Protection Plan

Sequence 1

No Backup Phase	1	2	3	4	5	6	7	8
Serve Phase 1	-	-	-	-	-	-	-	-
Serve Phase 2	-	-	-	-	-	-	-	-
Serve Phase 3	-	-	-	-	-	-	-	-
Serve Phase 4	-	-	-	-	-	-	-	-
Serve Phase 5	-	-	-	-	-	-	-	-
Serve Phase 6	-	-	-	-	X	-	-	-
Serve Phase 7	-	-	-	-	-	-	-	-
Serve Phase 8	-	-	-	-	-	-	-	-

Front Panel
Main Menu >Controller >Sequence & Phs Config>Backup Prevention >
Backup Call Phase Plans

Web Interface
Home >Controller >Backup Prevention >Backup Calls Phase Plans >

Sequence 1

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0927
DESIGNED: June 2026
SEALED: 06/04/2026
REVISED: N/A

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channel Configuration

Channel Configuration

Notice Red Flash

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

Electrical Detail - Sheet 2 of 2

Front Panel
Main Menu >Controller >Unit

Web Interface
Home > Controller > Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

Electrical and Programming
Details For:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC

US 421 Business (West D Street)
at
SR 1500 (Boone Trail) /
Walgreens Drive

Division 11 Wilkes County North Wilkesboro

PLAN DATE: June 2026	REVIEWED BY: J O Deaton
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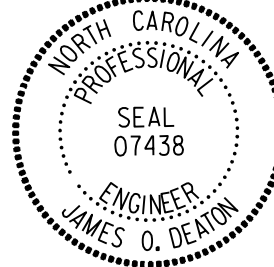
PREPARED BY: M W Yalch	REVIEWED BY:
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REVISIONS	INIT.	DATE
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEA



DocuSigned by:

James O. Deaton 6/5/2026

40FF0AC436BD40F... DATE

SIG. INVENTORY NO. 11-0927